

COMPUTERWORLD

IBM notebook on Harvard MBA track

BY RICHARD PASTORE
CW STAFF

BOSTON — While pundits have been debating the release date of IBM's notebook personal computer, the first-year class at Harvard Business School has been using more than 700 of the units since early last month. The students have found some fault with the devices, but in general, they said, the Personal System/2 L40SX makes the grade.

The Intel Corp. 20-MHz 80386SX-based unit includes a 60M-byte hard disk, 2M to 18M bytes of memory, a floppy disk drive and a modem that can send and receive data and

Continued on page 4



Stella Johnson

Harvard Business School student John Pollock taps away on the full-size keyboard of IBM's yet-to-be announced 386SX-based notebook PC. The PC is being used by 700 Harvard students

Microsoft feels heat of FTC investigation

Angst of rivals, antitrust issues boil to surface

BY PATRICIA KEEFE
CW STAFF

Last week's disclosure of a Federal Trade Commission investigation into possible antitrust activities on the part of Microsoft Corp. fueled the flames of resentment that applications vendors have toward the company, but few observers expected much to come of the probe.

Microsoft confirmed the investigation following a report on it released by Goldman, Sachs & Co. analyst Rick Sherlund.

Microsoft said the probe was triggered by a November 1989 press release that outlined the future of Windows and OS/2. At the time, Microsoft and IBM positioned OS/2 as the platform of choice, with Windows relegated as a low-end graphical system.

Published statements attributed to Microsoft Chairman Bill Gates indicated that IBM was also a subject of the investigation. An IBM spokesman would

only say that IBM is aware of the investigation and is cooperating with requests for information. The FTC does not comment on "nonpublic" investigations.

Although the probe has been under way for more than a year, observers close to the company said Gates is taken aback by the

DIRECTION OR DECEPTION?

November 1989 announcement on future directions for Windows and OS/2:

► 'The "platform for the '90s" [are] hardware systems with Intel 80386 or 486 ... with OS/2 and Presentation Manager'

► 'Beginning in the second half of 1990, IBM and Microsoft plan to make their graphical applications available first on OS/2'

► 'DOS and Windows are recommended for systems with 1M to 2M bytes of memory or fixed disk drives smaller than 30M bytes'

attention being given to the investigation.

Leading software developers have long railed against Microsoft's alleged control over the personal computer software industry and conflicting statements of direction on Windows

Continued on page 101

DG delivers its RISC-hot Unix server

BY SALLY CUSACK
CW STAFF

NEW YORK — The soul of Data General Corp.'s latest machine is no larger than a pizza box. With four processors generating 117 million instructions per second, the Unix server represents a bid by the ailing minicomputer maker to reclaim its tradition of being able to deliver the hottest engine on the market.

DG is hoping that the next billion dollars' worth of revenue will come from the machine, which is based on Motorola, Inc.'s 88100 reduced instruction set computing technology. Designated the 7000 and 8000 series, all models are currently available.

The key question, according to Jay P. Stevens, an analyst at Dean Witter Reynolds, is whether DG can market and sell the product. He noted that although the company has a tradition of high-performance products with

Continued on page 8

Oracle for Vaxcluster, Take 2

Performance boost ends 18-month rewrite effort

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Systems Corp. has taken a lemon — the flawed Version 6.0 of its Oracle relational database management system for Digital Equipment Corp. Vaxclusters — and tried to make lemonade.

In providing a fix designed to make Oracle Version 6.0 work well in Vaxclusters, Oracle suggested last week that the same

procedure be applied to loosely coupled configurations of Unix computers and even mainframes linked by IBM's Sysplex.

Parallel Server, the new software in Oracle Version 6.2, will be applied to Unix computers made by Pyramid Technology Corp. and Sequent Computer Systems, Inc. That is only if Pyramid and Sequent can come up with their own equivalent of the Vaxcluster's DEC Lock

Continued on page 100

Few flaws in postwar weapons check

BY MITCH BETTS
CW STAFF

President Bush called the allies' stunning success in the Persian Gulf war "a triumph of American technology." Military experts raved about how the computer-coordinated air strikes and computer-guided weapons quickly overpowered the Iraqi military.

Even so, military analysts noted in their postwar assessments that some of the battlefield technology showed its limitations, and there is room for improvement. For example:

• Satellites provided six minutes of warning before a Scud missile hit, but four minutes were eaten

up by the data transmissions relayed to the U.S. and then to the Middle East, according to Tom Baranaukas, an analyst at

Continued on page 99

Honor roll grades for high-tech weapons

Military analysts say computerized systems worked exceptionally well in Operation Desert Storm

REPORT CARD

Smart bombs	A
Cruise missiles	A
Patriot missiles	B+
Electronic countermeasures	A
Command and control	A+
Satellites	B+



Patriot missile earned high marks in Gulf action

Graders: Richard Thomas (Center for Strategic Technology), Ron Hertenstein and Tom Baranaukas (Forecast International), Jeffery Shaffer (Center for Strategic and International Studies) and John Pike (Federation of American Scientists)

CW Chart: Marie Haines

INSIDE

VDTs don't boost miscarriage rate, according to a federal health study. Activists fault the study's methodology. Page 100.

D&B Software's downsizing slices another 300 people from the payroll. Page 12.

Tandy to break CD-ROM price barrier with \$400 unit. Page 101.

Morris loses appeal, mulls over asking Supreme Court to overturn his Internet worm conviction. Page 6.

In Depth — A Q&A with scientist and inventor Raymond Kurzweil. Page 75.

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7 NCR machines are still in demand, as evidenced by Wal-Mart's \$20 million purchase of the firm's 3000 series processors.

8 Now is the time to buy Decstations, as DEC drops prices on its line of Unix-based RISC systems.

10 Daimler-Benz races ahead of the European pack by implementing fast-packet multiplexers to link LANs.

12 Restructuring continues at D&B Software, but 300 employees will not.

16 In a move toward outsourcing, GTE Directories fires 5% of its systems development staff and reorganizes the IS department.

99 High-tech shipments to Iraq in the five years before the invasion of Kuwait raise questions as to whether the donations were instrumental in aiding Saddam Hussein.

100 A study by the National Institute of Occupational Safety and Health claims that pregnant women working at VDTs are no more at risk of miscarriages than women who aren't.

Quotable

"Knowing Saddam Hussein now, we don't want to sell him anything. But at the time, it made sense."

PAUL FREEDENBERG
WASHINGTON ATTORNEY

Regarding U.S. high-tech exports to Iraq before it invaded Kuwait. See story page 99.

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EXECUTIVE BRIEFING

■ The U.S. military industrial complex earned honor roll grades for the high-tech weapons it sent into the war with Iraq, even though some of the computers and other sophisticated machines sometimes fell short of perfection. But far from final is the report card for the U.S. high-tech equipment deployed by Iraq. More than \$500 million worth of U.S. computers and other gear was exported to Iraq during the five years before the war, but it's unclear how Iraq used the equipment. **Pages 1 and 99.**

■ The eyes of Washington are on Microsoft, which confirmed last week that the Federal Trade Commission is investigating it for possible antitrust violations relating to some of its positioning of OS/2 and Windows. While observers said they do not see the probe as likely to turn up gross wrongdoing, they are watching to see if the investigation attracts more complaints about Microsoft's business practices. **Page 1.**

■ The wait for the report on pregnancy and VDTs ended last week when the National Institute for Occupational Safety and Health said it had found no evidence that women working with VDTs are more likely to suffer miscarriages. However, observers questioned the research methodology used. **Page 100.**

■ On the technology front, faster and smaller was the order of the day last week. Data General said it has packed a four-processor system capable of 117 MIPS into an Avion computer smaller than a pizza box. **Page 1.**

■ Interest in advanced technology continues to grow in many organizations, despite a gloomy economy. **Page 65.**

■ Donald R. Beall, chairman and chief executive officer of Rockwell International Corp., wins Gartner Group's Excellence in Technology Award. **Page 6.**

■ Staff cuts are in the works at GTE Directories and Goodyear. The systems development staff is being cut at GTE, while at Goodyear, IS executives are unsure how a 1,100-person reduction in force will impact IS. **Page 16.**

■ Bridging the gap between technology and business has been a topic of conversation for years. However, not enough people are doing anything about it. A few consultants claim they have

plans for closing that gap. **Page 59.**

■ How important is your IS operation in the eyes of Wall Street analysts? "Not very" may be the answer. One researcher says securities analysts have started looking at IS' impact on a firm's bottom line. **Page 59.**

■ Mail-order companies are relying more heavily on IS to create innovative marketing and inventory applications. For IS executives, this translates into more jobs and higher pay. **Page 83.**

■ An ounce of prevention can save an IS buyer a pound of cure if his software vendor files for Chapter 11 bankruptcy. One issue of concern is the license agreement and what it provides for when a vendor files for bankruptcy protection. **Page 91.**

■ On-site this week: In what is being called a "Blue Flush" based on price/performance, the city of Houston erases IBM hardware from its computer room and replaces it with an Amdahl system. **Page 29.** A multimedia application is taking its place in the new-employee recruiting process at a New York Life Insurance group. **Page 39.** Giving managers time to think about business rather than pounding calculators is the idea behind an automation project at the Au Bon Pain restaurant chain. **Page 43.** A satellite-based tracking system is helping North American Van Lines speed pickups at customer sites. **Page 47.**

The 5th Wave



"To get SQL, they said I'd have to walk away from 20 years, millions of dollars and start all over again.

I told them to

go fish

and today, I have navigational and relational technology together, in a single database. They said I couldn't do it, but who listens to them anyhow?"

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ICL pioneers ISDN for Windows 3.0 environment

BY ELISABETH HORWITT
CW STAFF

STAMFORD, Conn. — ICL, Inc.'s North American Division announced last week what is said to be the first Integrated Services Digital Network (ISDN) desktop conferencing system for the Microsoft Corp. Windows 3.0 environment. The announcement of real, live ISDN applications for the popular Windows environment could give a much-needed kick in the pants to a still-sluggish ISDN market.

Originally developed for Microsoft OS/2-based systems, ICL's Desktop Conferencing Package is said to allow geographically separated users to simultaneously view and mark up an application on their Windows screens. Users, meanwhile, can be talking over the telephone via the same ISDN link, according to ICL.

ICL "finally got smart" with its move from OS/2 to Windows, said Price Craddock, a telecommunications analyst at Hardee's Foods Systems, Inc. Hardee's, now in the midst of an ISDN point-of-sale network implementation, uses DOS, not OS/2 workstations, he added.

The Rocky Mount, N.C.-based food chain is less interest-

ed in desktop conferencing than in providing ISDN's 64K bit/sec. switched links for inexpensive bulk data transfer between remote sites, Craddock said.

However, the company is not ready to pay \$2,195 per person-

dows-based ISDN will be challenged shortly by rival Teleos Communications, Inc. in Eaton, N.J. Several third-party vendors are writing Windows applications to Teleos' ISDN adapters and servers, with formal an-

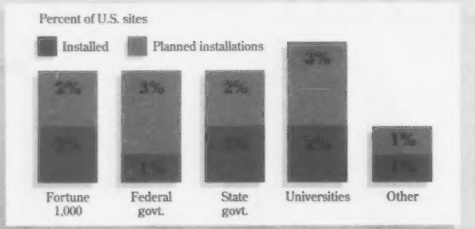
said. Instead, they are limited to the typical PC rate of 19.2K bit/sec.

The North American ISDN Users Forum hopes to address this problem by midyear with the release of specifications for a common interface between applications and various vendors' ISDN boards, Best said. If the interface generates widespread industry support, software applications written to it will be able to take advantage of ISDN speeds on a wide variety of ISDN adapters, he added. This development may finally encourage leading PC software vendors to develop packages specifically for ISDN. Both Teleos and ICL said they intended to support the workshop's application interface.

ICL's Desktop Conferencing Package for Windows 3.0 requires the vendor's ISDN software and hardware. The \$2,195 price tag includes both products as well as Windows-based file folder and phone book applications. The products support IBM Personal Computer AT, Extended Industry Standard Architecture and Micro Channel Architecture buses. Availability of the Desktop Conferencing Package for Windows 3.0 is scheduled for May.

Consistent resistance

No matter how you cut it, the penetration of ISDN remains minute, with no indication of any great upswing



Source: Computer Intelligence

CW Chart: Tom Monahan

al computer to provide its users with ICL's ISDN hardware and software, Craddock said. ICL's product would be more suitable to the company's needs if it could act as an ISDN gateway for multiple users on a local-area network system such as Microsoft's MS-Net, he added. ICL has no announced plans for a LAN version of its product.

ICL's exclusive claim to Win-

nouncements expected by year's end, Teleos spokesman Reggie Best said.

Imposed limits

One limitation of current ISDN technology is that existing Windows applications that are not written to a specific ISDN hardware platform like Teleos' cannot make use of the full 64K bit/sec. ISDN link, vendor sources

Harvard

FROM PAGE 1

facsimiles. At the earliest, the L40SX will debut next week for \$6,000, industry observers said. IBM arranged a special deal with Harvard to deliver the PCs for about \$2,800 each.

IBM spokesman Kevin Clark confirmed that students are us-

L40SXs have experienced only a few scattered bugs, students reported. Indeed, the school newspaper recently likened the two on-site IBM service agents to Maytag repairmen.

The L40SX is wider (10.7 by 12.8 by 2.1 in.) and heavier (7.6 pounds) than some of its notebook predecessors. These dimensions, however, are needed to house the nearly full-size keyboard that some observers called the best in the notebook business.

IBM touch

Its 84 full-size, standard-spaced keys are arrayed in a five-degree slope and match the desktop PS/2 key layout. Although each key is half-height, "it still has the distinctive IBM touch and travel," first-year student John Pollock said.

Compaq Computer Corp.'s LTE keyboard suffered in comparison.

The LTE relocates and shrinks its peripheral keys. "If you're a good typist, Compaq is a pain in the neck to deal with," MBA candidate John Richter said. "I'd take [IBM] over the LTE anytime."

According to Compaq Vice President of Product Marketing Lorie Strong, the larger overall size required for a full-size key-

board is a trade-off Compaq users do not want to make. The additional inches make it less likely the unit will fit in a briefcase, she said.

Standard LCD

Unlike the keyboard, the IBM Video Graphics Array LCD side-lit screen is standard fare, according to most students.

Others, however, were disappointed. "The screen is difficult to read at times; a lot of bleeding occurs," student Steve Petrow said.

Even at a substantial discount, some students said the machine is overpowered and overpriced for their needs. John Labine said he opted for a \$1,600 Intel 80C86-based Toshiba T-1000LE instead.

The fact that the IBM note-

books are beta-test units also worried Labine. "You've got the support of the school while you're here, but what happens when you graduate?" he asked.

So far, the biggest problem with the campus machines is disappointing battery life. Because exams last three hours, the school was counting on a minimum three-hour life.

"We tried it under simulated exam conditions, and it wasn't giving us the required three hours," said Richard Hespos, assistant dean and director of information technology.

To put students at ease and avoid embarrassment for the school and IBM, Hespos said, he arranged for IBM to deliver a truckload of spare batteries in time for the semester's first exams late last week.

CLARIFICATION

A section of two articles on Computer Associates International, Inc.'s VSE line of products (CW, Feb. 4, Feb. 25) stated that the company is imposing charges on users upgrading from VSE to VSE/ESA Version 1.1. Those charges are levied only on those users who choose optional modules operating within the VSE/ESA environment, modules available on about 18 of CA's 100-plus VSE products. CA said all of its VSE products can be run in the VSE/ESA environment without any extra fees levied by CA (see letter page 24). Also in the Feb. 4 story, a source stated that he had spoken with "between six and 12 CA VSE customers" who were upset about pricing policies. At the time the story was written, *Computerworld* had not checked with the source to verify those numbers or the names of those other customers. The source subsequently has revealed names numbering in that range, but many of them were not necessarily for attribution.

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Stella Johnson

IBM's PS/2 L40SX is the laptop of choice for first-year students at Harvard Business School in Boston

ing a laptop that will be marketed by IBM "when we can manufacture sufficient quantities to satisfy anticipated demand."

By most student accounts, the notebook is a solid but not vastly innovative piece of equipment.

Despite being the first notebooks ever to come off of an IBM assembly line, the Harvard

Closing Arguments

Only ORACLE supports virtually every vendor's software, hardware and network.

Today, some software companies claim that their software products are "open." They may even graft the word onto their product names. It is a confusing situation, but a clear definition of "open" is finally emerging.

Software is "open" only if it adheres to industry standards and works with products from other vendors.

vendors.

The word cloud contains the following words:

- SO
- OPEN
- N
- O
- PEN
- STANDARDS
- VIEW
- SYSTEMS
- ARCHITECTURE
- VERY OPEN
- MOST OPEN

More specifically, a database

More specifically, a database is open if it works with other vendors' databases. For example, ORACLE provides access to IBM's DB2, SQL/DS and DEC's RMS.

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NEWS SHORTS

OSF runs distributed computing test

Last week, five leading computer vendors participated in what is said to be the first demonstration of the ability of the Open Software Foundation's (OSF) Distributed Computing Environment to distribute applications across multivendor systems. During the demonstration, which took place at the Cebit '91 conference in Hannover, Germany, networked Hewlett-Packard Co., Digital Equipment Corp., Groupe Bull, Siemens-Nixdorf and IBM computers cooperatively processed different subtasks of a financial application. The application involved accessing and processing data from the New York Stock Exchange and displaying the retrieved data using the OSF's Motif graphical user interface.

IBM shows OSF/1 on mainframe

In another Cebit demonstration, IBM ran the OSF's operating system, OSF/1, in native mode on a System/390 mainframe. IBM, which had previously run the OSF/1 demonstration at a closed-door Share user group meeting, also showed graphics-based software including Motif, X Window System and three-dimensional graphics applications on the System/390.

Institute aims to serve Third World

The United Nations University, a scholarly unit of the United Nations based in Tokyo, established a software institute last week that will train people in developing countries to build microcomputer applications software that meets the special needs of developing countries. The \$30 million International Institute for Software Technology will be located in the Portuguese colony of Macau, near Hong Kong.

Informix suffers new loss

Following several months of accounting effort, Informix Software, Inc. said last week that it tallied \$46.4 million in losses on 1990 sales of \$146.1 million, and it does not expect to have a profit for the first quarter ending March 31. The redoubled accounting effort came after a January decision to restate all Informix revenue since the firm's founding in 1980. The accumulated adjustments were taken as a onetime charge in the first quarter of 1990, Informix said. However, slowed sales growth resulted in losses for the balance of the year as well.

IBM signs marketing deal

IBM and product information management software player Sherpa Corp. said last week they will co-market Sherpa's Unix-based wares on IBM's RISC System/6000 platform. For San Jose, Calif.-based Sherpa, the pact marks a key step in its plan to forge an interoperable product information management ring for manufacturing and engineering environments. Its roster of marketing partners already includes DEC, Sun Microsystems, Inc. and HP.

No trial yet in Lotus vs. Borland

At a pretrial conference with Lotus Development Corp. and Borland International, Inc. last week, U.S. District Judge Robert Keeton declined to end discovery or set a trial date in Lotus' copyright suit. He did say that the trial should be phased, much as it was in Lotus' suits against Paperback Software International, Inc. and Mosaic Software. Lotus wanted to go to trial in early summer. The next pretrial hearing is slated for June 18.

3Com switches to Du Pont cleaner

3Com Corp. claimed that it is the first Silicon Valley manufacturer to replace chlorofluorocarbon (CFC) solvents with Du Pont Electronics' Axarel 38, an alternative to CFC-113, which is commonly used to clean printed circuit boards. Axarel 38 does not emit harmful ozone-depleting substances. According to 3Com, its production facilities will be CFC-free by June 1992, in compliance with international protocols on environmental toxins.

More news shorts on page 100

Groupe Bull unveils OSF/DCE framework

BY SALLY CUSACK
CW STAFF

Groupe Bull unveiled its Distributed Computing Model last week — a combination of products and prototypes designed to take Bull users to open systems while attracting independent software vendors to the fold.

The framework, announced at the Cebit conference in Hannover, Germany, is based around the Open Software Foundation's Distributed Computing Environment (OSF/DCE) standards. Components announced included the following:

- Affinity, a line of micro-to-mainframe links for integrating Microsoft Corp.'s Windows-based personal computers with Bull GCOS 6, 7 and 8 operating environments, formerly available in Europe and now offered in the U.S.

- Open 8, which provides inter-

operability between GCOS 7, GCOS 8 and Unix environments and is scheduled for release in the second quarter.

- The previously announced Bull DPX/Prostation, a Unix-based workstation.

- The Open Team server environment, which allows customers to run Microsoft's LAN Manager in a Unix environment.

William McCusker, a Bull mainframe user at Citrus College in Glendora, Calif., said he was encouraged by Bull's move toward open architecture and the world of distributed computing. A former officer of the Bull Users Group, McCusker said users have seen a decided increase in both commitment and activity from the vendor during the past year.

"It's nice to see this come along; customers have been looking for it. But it would have been nicer had it come along

about a year ago," said Wayne Kernochan, a senior analyst at The Yankee Group, a Boston-based research and consulting firm.

In addition to reassuring customers, Kernochan added, the announcement shows the European community that Bull is indeed serious about standards.

Roy McRee, assistant general manager of information systems at Graybar Electric Co., a Bull 9000 mainframe shop, said that while the model was not something he could implement at the present time, he would not rule it out for the future.

The model could win Bull new business in the public sector and federal government markets, according to Bob Tasker, vice president of software research at International Data Corp., a Framingham, Mass.-based research and consulting firm.

"This is a model, not a cookbook," emphasized Stephen P. Gardner, vice president of U.S. marketing at Bull HN Information Systems, Inc. "It can be implemented piecemeal by users as needed and can be used to plan future open specifications."

Rockwell CEO wins technology award

STAMFORD, Conn. — For the second straight year, Gartner Group, Inc. has chosen the head of a manufacturing company as the winner of its annual Excellence in Technology Award.

Donald R. Beall, chairman and chief executive officer at Rockwell International Corp., was selected by a group of nine information systems executives and one computer vendor executive. Xerox Corp. Chairman David Kearns was honored last year.

Beall was selected for promoting an IS strategy that has helped Rockwell make aerospace technology advances, communicate better with customers and improve product quality. El Segundo, Calif.-based Rockwell is the U.S.' fourth largest aerospace company, with 1990 revenue of \$12.4 billion.

Beall will receive the award April 10 at The Conference Board's information management conference in New York.



Rockwell's Beall earned Gartner Group's Excellence in Technology Award

Morris contemplates Supreme Court option

BY MICHAEL ALEXANDER
CW STAFF

The attorney for Robert T. Morris, convicted of releasing a worm program that shut down computers on the Internet network in 1988, said last week that Morris may take his case to the U.S. Supreme Court.

Morris received word last week that his appeal to the U.S. Court of Appeals for the Second Circuit was denied. Thomas Guidoboni, the Washington, D.C., attorney representing Morris, said three judges unanimously upheld Morris' conviction under the Computer Fraud and Abuse Act of 1988 in a 19-page decision released last week.

The appellate judges agreed with the trial court finding that the government was not required under the federal statute to prove Morris intended to cause harm and that he clearly lacked the authorization to ac-

cess the computers on Internet that the worm program invaded.

"Naturally, both Robert and I are real disappointed with the result," Guidoboni said. "We are considering going further, but no decision has been made yet."

Morris is currently employed as a programmer at a software development company in Cambridge, Mass. Guidoboni declined to identify the firm.

Two options

Two legal options remain open to Morris. The first is to return to the U.S. Court of Appeals within one week and ask to have the case reconsidered. The second is to petition the Supreme Court within 90 days to hear the case, either directly or after having asked the Appeals Court to reconsider.

Asking the Supreme Court to hear the case would be an expensive gamble for Morris. If the Supreme Court agrees to hear

the case, the cost of preparing and presenting the case would be considerable, Guidoboni said. He declined to say what Morris' legal costs have been thus far, but some legal experts have estimated that they are well in excess of \$150,000.

Morris created the worm program and launched it on the Internet the evening of Nov. 2, 1988. A programming error caused the worm to replicate uncontrollably and within hours caused an estimated 6,200 computers to shut down.

In January 1990, a jury in a federal district court in Syracuse, N.Y., found him guilty under a provision of the federal computer crime statute. In May, a federal district judge sentenced Morris to three years' probation, 400 hours of community service and ordered him to pay a fine of \$10,000 and about \$90 per month toward the cost of his supervision while on probation.

NCR says no to latest AT&T takeover proposal

Analysts say NCR will accept eventual takeover but is delaying to gain better deal

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — NCR Corp. scorned a new, \$100-per-share bid from hostile suitor AT&T last week.

While NCR's curt rejection caused AT&T to withdraw the bid, leaving the original \$90-per-share bid on the table, analysts continued to note a marked shift from Chairman and Chief Executive Officer Charles E. Exley Jr.'s initial hostility to a posture of maneuvering for the high price NCR can extract from AT&T.

"It's all coming down to strategy. How do you outflank your opponent when it's all going to come down to the shareholders' meeting as the battleground?" asked David J. Schofield, a research analyst at Duff & Phelps Investment Research Co. in Chicago.

"AT&T has got some interesting decisions ahead of it: Do you try to be preemptive, or do you lie back and let the votes go to see what happens after you get into the board?" Schofield added.

Analysts continue to say NCR's maneuvers will not help it escape AT&T, but

they will probably get the company a better price.

"I don't think the chances of AT&T's ultimate success have lessened any, but I think the timing and cost have become more uncertain," said Maria Lewis, telecommunications analyst and senior vice president of the Lehman Brothers division of Shearson Lehman Brothers, Inc., a wholly owned subsidiary of American Express Co.

Lewis added she thought the timetable was now being dictated by Exley instead of by AT&T Chairman Robert Allen.

Analysts agreed that AT&T has damaged its own Computer Systems Division (CSD) enough to make it imperative that it acquire NCR as quickly as it can. The division gave more employees pink slips last week as part of its previously announced efforts to control costs, which it said came before the takeover was launched. The total is now more than 500, many of whom may stay with the company because of a hiring freeze on outsiders by AT&T. According to AT&T's CSD, 73 of those let go have had to leave the firm involuntarily.

The picture may become more clear after tomorrow's Federal District Court decision on whether NCR's recently established employee stock ownership plan is legal.

Wal-Mart opts for Unix gear

BY MICHAEL FITZGERALD
CW STAFF

BENTONVILLE, Ark. — Despite AT&T's hostile takeover effort, NCR Corp. has landed a major sale of its System 3000 series with Wal-Mart Stores, Inc., which has agreed to buy an estimated \$20 million worth of NCR 3445 Unix processors for use in its stores.

The 3445 is an expandable uniprocessor server based on Intel Corp. 1486 chips running at 33 MHz. It predates NCR's System 3000 announcement [CW, Sept. 24, 1990]. These systems will be installed in approximately half of Wal-Mart's 800 stores, replacing IBM Series/1 machines.

The store systems will be used primarily for inventory management, supporting merchandise planning and taking information from point-of-sale terminals. Wal-Mart ported its own applications software to several Unix systems in a test last year.

Hewlett-Packard Co. systems were installed last year in Wal-Mart's other stores. The HP and NCR machines will run the same software and perform the same functions. Wal-Mart purchased from both vendors as part of its effort to keep costs down.

Adding flexibility

Bob Martin, senior vice president of corporate MIS at Wal-Mart, told *Computerworld* that "the key thing for us is we're on a technology platform that we can bend and flex a tremendous amount on." He added that NCR's "open architecture gives us a lot of flexibility to move and change as we need to."

Martin said he expected these machines to give Wal-Mart its in-store platform for the 1990s and allow it to do more with cooperative processing and interoperability.

Martin cited the scalability of both the NCR and HP machines, which won out over IBM's RISC System/6000, as another factor in the Wal-Mart decision. He said the company also looked at machines from AT&T and Digital Equipment Corp.

AT&T's bid for NCR complicated matters only slightly, Martin said. "We obviously crawled through the impact of that, but we do a significant amount of business with both companies, and we gained a comfort level that regardless of how things would go, we'd be OK."

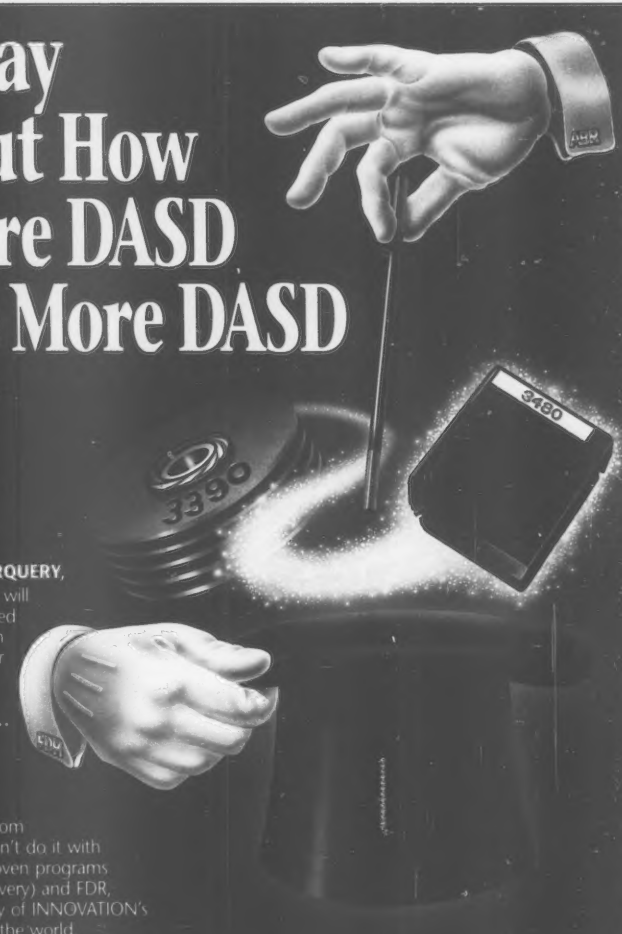
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IBM extends RS/6000 reach

BY PATRICIA KEEFE
CW STAFF

NEW YORK — IBM last week pumped up the performance and storage volume with additions to its RISC System/6000 family of workstations while also turning down memory and disk drive prices.

Missing, however, was a low-cost, entry-level Powerstation. IBM executives said a separate team is working in parallel on a low-end RS/6000 priced at less than \$13,000. It will ship in the second half of this year, according to Phil Hester, IBM director of the Advanced Workstation Division's Engineering Center.

Such a computer is not perceived as a threat to the high end of the Personal System/2 family, said Jeff Mason, IBM director of advanced workstations and AIX systems. Besides the fact that most PS/2 users have a heavy investment in DOS, which will not run on the RS/6000, Mason said, the two product families are built to serve different purposes.

Overall, RS/6000 users are more likely to be new or non-

IBM workstation users than power DOS users or IBM accounts, he added.

IBM is coming off of a good first year with the RS/6000, having shipped 25,000 units worldwide in 1990. Sixty percent of those sales went into non-IBM departments, while 30% went into non-IBM shops, according to IBM.

Price slicing

The additions to the RS/6000 family coincide with several promotions. Through September, IBM will slice \$1,500 off the Powerstation/Powerserver 320, offer a 10% discount for configured deskside or rack-mounted systems and provide memory upgrade pricing incentives.

The new models included the Powerstation/Powerserver 320H, the Powerserver 950 and the Xstation 130. Available March 29, the Model 320H is a beefed-up version of the RS/6000's low-end 320. Improvements include a faster processor with a clock rate of 25 MHz, 16M bytes of memory and 160M bytes of fixed disk stor-

age. Pricing starts at \$20,501.

The Model 950 server shifts the 41.6-MHz processor found in IBM's Powerserver 550 into a rack configuration. The Model 950 will be available in June starting at \$164,335.

The Xstation 130 terminal features higher performance graphics and I/O processors as well as more memory options than the Xstation 120. An entry-level monochrome system comes equipped with a 12-in. display, 2.4M bytes of memory and 1M byte of video memory for less than \$3,000. A similar system with a 14-in. display costs \$3,325. It is slated to begin shipping April 26.

The Powergraphics GTO is an external subsystem said to deliver graphics performance comparable to that of the Supergraphics Powerstation 730. It supports accelerated two- and three-dimensional line drawings, shading and other image viewing tasks. It is set to be available in August and costs \$19,500 for an 8-bit color model and \$29,500 for a 24-bit color model.

Also included in the an-

Power tuneup

IBM's latest RISC System/6000 includes more powerful desktop and rack-mounted models



Model	Clock speed	Performance: Linpack DP	Performance: Specmark	Memory	Price*
Powerstation 320H	25 MHz	11.7 MFLOPS	32.4	16M to 128M bytes	\$20,501
Powerserver 950	41 MHz	25.2 MFLOPS	56.3	32M to 512M bytes	\$164,335

* 320H configured with 16M bytes of memory, 160M-byte hard drive, display and system software
950 configured with 32M bytes of memory, 857M-byte hard drive, CD-ROM drive and system software

CW Chart: Marie Haines

nouncement were the following:

- Increased data storage capacity across all models: The Model 500 Deskside Expansion Unit provides up to 3.4G bytes of additional storage. Pricing starts at \$10,400. The Model 010 Drawer Expansion Unit (starting at \$9,900) and the Expansion Rack (\$5,500) allow the Powerserver 930 and 950 to support up to

22.2G bytes of disk storage.

- Memory price cuts: Add-on memory prices were reduced by 24% to 74%, depending on memory module size. Incremental memory, factory-installed by IBM, was cut by 44% to 66%. IBM also cut prices on two 5 1/4-in. fixed disk drives: the 355M-byte drive (by 26%) and the 670M-byte drive (by 32%).

RISC

FROM PAGE 1

good prices, sales and marketing have never been a DG strength.

Washington Medical Center, a user of DG's proprietary MV midrange computers, evaluated systems from Sun Microsystems, Inc., IBM, Silicon Graphics, Inc. and Hewlett-Packard Co. "We found that even within the university discount framework, the Avion offered a very good price/performance," said Thomas Lewellen, professor of radiology.

The university is using an Avion 7000 machine to support an imaging device that displays metabolism in human beings.

Despite Avion sales to Washington Medical, the Odessa Shipyard in Denmark and the New York Power Authority, several industry analysts expressed concern over the lack of support for

the Motorola 88000 chip. DG is the only hardware vendor to commit to the architecture.

DG countered those perceptions by pointing to software support for the Avion from developers such as Oracle Systems

Corp., Informix Software, Inc. and Progress Software Corp.

The systems have an entry price of \$96,000, which includes a deskside system with 16M bytes of memory and 662M bytes of disk storage. The high-end, rack-mount 8000 models offer 128M bytes of memory and 5G bytes of disk storage and are priced at \$249,520.

"If you're going to be aggressive in standards-based systems, the basic delivery mechanism has to be small," said Tom West, DG's senior vice president of Advanced Systems Development, referring to the size of the quad-processor.

The symmetric multiprocessing systems run under the DG/UX 5.4 operating system

and offer a VME interface for industry standard I/O functions.

DG's longstanding financial problems, including several rounds of layoffs and a string of losses, were alleviated somewhat when it showed a profit in its most recent quarter.

Lewellen said he is optimistic about DG's long-term viability. "We have not seen any erosion in support and service, even during the hard times," he said.

DG has a considerable lead in dollars per MIPS, but not necessarily in dollars per specmark, according to Chris Christianson, an analyst at Meta Group, Inc., a market research firm in Westport, Conn.

For commercial integer-based applications, DG has a decided advantage because of the speed. For floating point, scientific applications, the RISC System/6000 and upcoming HP machines are formidable challengers, Christianson said.

DEC slashes RISC prices

MAYNARD, Mass. — Digital Equipment Corp. last week announced price reductions and new configurations for its Decstation line of Unix-based reduced instruction set computing (RISC) systems.

The Decstation 3100 workstation dropped in price from \$6,995 to \$4,995, effectively replacing the Decstation 2100 system as DEC's entry-level RISC workstation. DEC also knocked \$2,000 off the color versions of the Decstation 3100, which now start at \$7,495 and \$8,995 for 16- and 19-in. configurations.

Prices for all models of the Decstation 5000 family have been reduced by \$1,500, and the company introduced a new monochrome version of the Decstation 5000 Model 200 MX for \$12,495. The Decstation 5000 also received a memory boost to a maximum of 480M bytes.

but said it expects the chip to be in systems by late 1992.

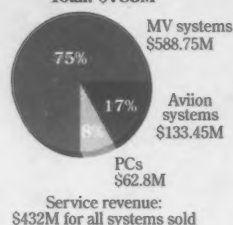
Also expected to be announced will be the Sun Mbus, a set of specifications that will allow a Sparc chip daughter card to simply be plugged into a motherboard rather than redesigning the board each time new chips come out. This will shorten time to market, according to Bill Keating, director of corporate technology marketing at Sun.

RISC factor

Avion sales represented almost one-fifth of DG's product revenue last year

Percent of 1990 product revenue

Total: \$785M



Source: International Data Corp.

CW Chart: Paul Mock

Sun heralds speedier chip architecture

BY J. A. SAVAGE
CW STAFF

MENLO PARK, Calif. — Sun Microsystems, Inc. is scheduled to announce a chip architecture today that promises to allow for a faster chip with more conservative technology than the leading-edge reduced instruction set computing (RISC) technology announced last month by archival MIPS Computer Systems, Inc.

Despite its more conservative design, it will be able to run at up to 1 billion instructions per second, according to Phil Huelson, vice president and director of technology at Sparc International.

Menlo Park-based Sparc International is an independent organization responsible for testing Sun compatibles to ensure that they will run all Sun software.

Instead of focusing on large

addressing space and arithmetic logic, Sparc Version 8 is focusing on the ability to string processors together in symmetric multiprocessing to increase computer speed, Huelson said.

The 32-bit Version 8 is a set of specifications that will be implemented differently by the nine semiconductor vendors that license it. MIPS' specifications are not open to interpretation by semiconductor makers.

Sparc International is in no

hurry to go to a 64-bit architecture because it would be far ahead of any software to take advantage of it. "There may not be [64-bit] software until the mid-to late 1990s," Huelson said.

Version 8 will have some 64-bit blocks, however. Its path to cache and main memory will be 64 bit, but its addressing will remain 32 bit. Its arithmetic logic unit is 32 bit, but its floating point unit can be 64 bit. MIPS' R4000 will be 64 bit throughout. Version 8 is expected to be available this year. MIPS has not set a date for delivering the R4000

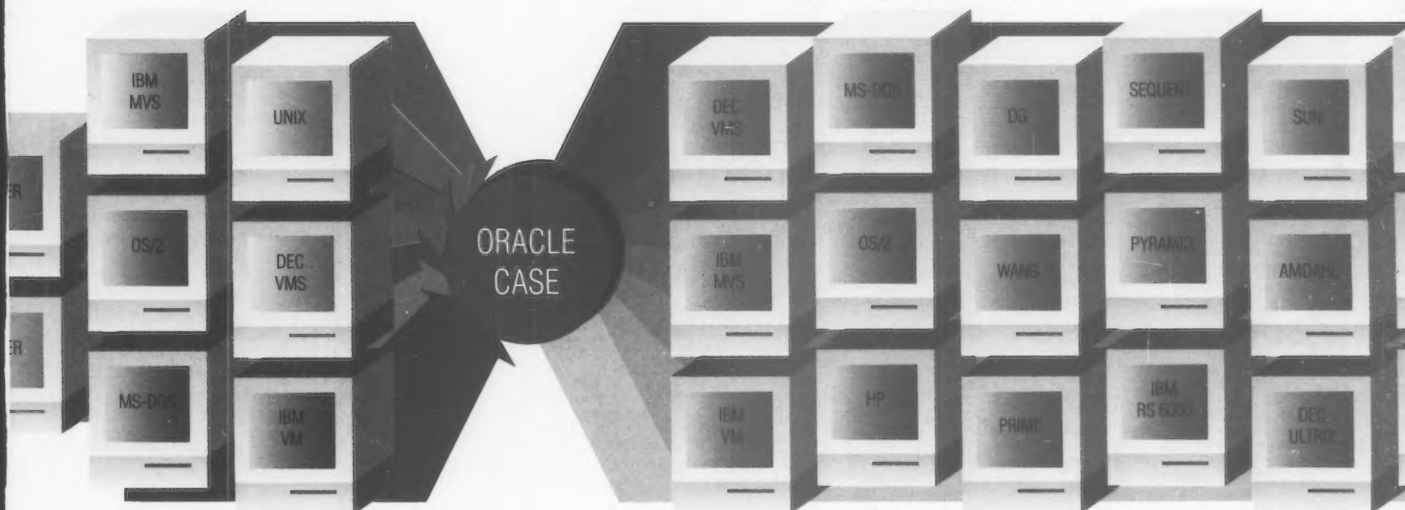
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Daimler-Benz races fast-packet loop

BY JOANIE M. WEXLER
CW STAFF

STUTTGART, Germany — The largest industrial firm in Europe is embarking on the installation of a \$6 million, new-generation backbone this week to conserve vast amounts of expen-

sive bandwidth and fuse its potpourri of incompatible networks.

Daimler-Benz, a \$56 billion firm that European industry considers conservative in its implementation of new technology, will likely lead the fast-packet brigade in Europe by taking a pioneering plunge with the tech-

nology. The firm plans to install 14 fast-packet multiplexers — efficient packet-switching devices that are infiltrating companies that need to interconnect local-area networks and transmit other bandwidth-hungry traffic.

Daimler-Benz will use fast-packet IPX T1 multiplexers

from Campbell, Calif.-based Stratacom, Inc., the only multiplexer vendor to date with an installed base of fast-packet equipment.

"The main impetus behind going with fast-packet is the money we'll save in bandwidth conservation," explained Claus Weier, network engineering planner at Debis Systemhaus GmbH, the computing and net-

work services arm of Daimler-Benz. Weier said a three-node IPX beta test he has been running since July has shown the technology can reduce the bandwidth needed for existing applications by up to 40%.

In Germany, 2M bit/sec. E1 lines (the European version of the U.S.' 1.5M bit/sec. T1 lines) are two to three times the price of T1 links in the U.S., according to Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C. In other European countries, he said, leased E1 lines are often even more expensive, a situation that has thwarted many traditional circuit-switched T1 equipment sales in Europe.

"Daimler is putting in this network as a precursor to 1992, when the European Economic Community will open up and competition will drive rates down," Dzubeck commented. "Daimler justified the cost savings based on cost/performance ratios on today's dollar; they'll save even more money when the rates fall."

The wise choice

Fast-packet technology, the latest generation of packet switching, makes more efficient use of bandwidth by eliminating network overhead for error detection and correction on every network node. This is made possible by today's highly reliable digital communications lines.

The Daimler companies' myriad equipment embraces a variety of protocols — such as IBM's Systems Network Architecture, Digital Equipment Corp.'s Decnet and X.25 packet switching — linked via wide-area leased communications lines of varying speeds.

"Another goal with the IPX backbone is to merge all those separate networks onto a new corporate network for which the Stratacom multiplexing equipment will be the common denominator," Weier explained.

The initial 14-node network will link several thousand employees in the five Daimler-Benz firms in Germany, the largest of which is automaker Mercedes-Benz. The network is slated to ultimately support Daimler employees and third-party customers both inside and outside of Germany.

Fast-packet technology will support emerging videoconferencing, LAN interconnection and computer-aided design file transfer applications, Weier said. While he is hoping to someday fold voice traffic onto the backbone for additional bandwidth efficiencies, Weier said, the German Postal Telephone and Telegraph monopoly on voice traffic currently precludes him from doing so.

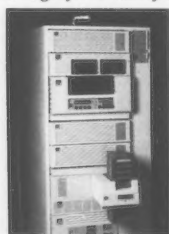
Full network implementation should be complete by midsummer, according to Weier.

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D&B Software still downsizing

U.S. work force hit hardest as firm trims 300 staff members

BY SALLY CUSACK
CW STAFF

FRAMINGHAM, Mass. — Dun & Bradstreet Software laid off 300 employees last week as part of a worldwide internal restructuring, company officials said.

The biggest hits came here in the U.S., where approximately 240 people were told they no longer had jobs.

According to company spokesman George Cohen, 75 employees were dismissed from the Atlanta offices and 75 from the Framingham headquarters. An-

other 40 were affected when the Southeast and Southwest operations were consolidated into one regional entity, and the remainder were drawn from various field offices.

D&B Software trimmed its international work force from 4,100 to 3,700 employees last year, when the company restructured itself following its birth in the merger of Natick, Mass.-based McCormack & Dodge and Atlanta-based Management Science America, Inc.

According to Cohen, one-third of last week's departures were because of re-

dundant middle management and administrative functions; one-third were drawn from development, support and education; and the remaining third came from the marketing and field operations staff.

"We started planning the restructure last fall, and when we put the financial plan against the strategic plan in January, it was obvious we had to refocus resources to meet the changing market," said Hank Holland, D&B Software's president and chief operating officer.

More user attention

Part of the company's refocusing plan, according to Holland, is to place emphasis on account management sales, as opposed to the traditional new account sales. That could mean more attention for D&B Soft-

ware's existing user base.

Holland denied internal rumors that more cutbacks would be implemented this summer and speculated that as the company restructures itself, there will be additional hiring this year, most likely in the professional services area.

Employees were given two weeks notice in addition to a severance package, and the vendor has contracted an outplacement firm to assist with interviews and resume writing.

Unisys to unload finance portfolio

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Struggling to reduce \$3.7 billion in corporate debt, Unisys Corp. officials last week said the company would liquidate most of its finance subsidiary's portfolio by this summer.

The finance unit had approximately \$750 million in outstanding debt owed to it at the end of last year, said a Unisys spokesman, who could not say if Unisys had found a buyer for these receivables.

"It was an obvious move because the finance sub wasn't getting new business," said David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago. Since last fall, when Duff & Phelps and other investment houses downgraded Unisys' investment grade, the finance group has found the cost of obtaining capital prohibitively expensive, Schofield said.

Unisys said the finance unit will continue to function as a marketing tool, helping customers arrange funding for Unisys equipment from other sources.

Minimal customer impact

The impact on customers should be minimal, leasing analysts said.

"In some captive leasing companies, it is standard practice to write a lease with an end user and then sell it off to investors," said Thomas J. Donovan, director at Technology Investment Strategies Corp. in Framingham, Mass.

During a liquidation of this scope, Donovan added, some users with special needs might experience some "confusion and bumps." He said the buyer of a portfolio of this size would probably be a large financial services company rather than a computer leasing company.

Although it has not specified which assets it has on the block, Unisys has publicly indicated it has about \$1 billion in assets up for sale. Rick Martin, a Prudential Securities, Inc. analyst in New York, said he has been told privately by Unisys that it still hopes to sell \$500 million in assets by the end of the year — a target he thinks the company will reach.

As a wholly owned subsidiary, the group will now have its own financial statement. Unisys could also decide to spin the company off as an independent, as Honeywell, Inc. did several months ago, Martin said.

A third possibility, Martin said, is that Unisys will smooth the way for the acquisition of some or all of its commercial business by a foreign buyer. Previously, many industry analysts had noted that because of the defense unit, Unisys would run afoul of U.S. government regulations if it was bought by a foreign firm.



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**HEWLETT
PACKARD**

GTE Directories looks to outsourcing

Phone book producer cuts 35 IS staff members, prepares to farm out much of its work

BY JOHANNA AMBROSIO
CWI STAFF

DALLAS — GTE Directories Corp. last week fired a portion of its systems development personnel and reorganized its information systems group in a step toward greater reliance on outsourcing.

A producer of Yellow Pages phone books, GTE Directories fired 35 people in the database administration group, among others, out of a systems development staff of 183. An additional 100 or so

other IS people work in areas such as operations and telecommunications. GTE Directories is a subsidiary of GTE Corp. in Stamford, Conn.

The reorganization split the IS staff into project teams. Previously, the IS group was aligned around the user organizations and took their direction in an "unscheduled, unplanned fashion," according to a GTE Directories spokesman. He said no further IS personnel cutbacks are planned.

"We are not going to be a company

that builds applications," said Doug LaVelle, vice president of production and information management. "We are going to buy packaged software, customize it and integrate it into our overall systems plan. This is our strategic direction."

LaVelle said the company is "aggressively looking at" replacing its current directory publishing system, which consists of homegrown software for page layout and other functions, with a series of packages from a company called Amdocs in St. Louis. The Amdocs software is used by

other directory companies, including Southwestern Bell Telephone Co., which owns a stake in Amdocs and competes with GTE in the Dallas area.

The old system, called Ramp, runs on IBM mainframes. The Amdocs software runs on Digital Equipment Corp. machines and is based on a proprietary database management system. GTE Directories already has one Amdocs package in production for pagination, with another for telephone sales in development. Others are to be implemented within two years.

The total cost of the project — hardware and software — is said to be \$70 million, a figure that LaVelle would neither confirm nor deny.

Differing opinions

Observers differ in their views of GTE Directories' new strategy. "I totally agree with the direction," said Don Cotton, former vice president of GTE Directories' Information Management Group, who is now retired. "They're going with a decentralized mode of computing rather than a centralized one. It may even result in more processing power, just more spread out."

Perhaps understandably, one of the fired IS staff members does not see it quite that way. "Management didn't feel that our in-house MIS staff could develop this type of functionality within two years, and I agree with them. But at the same time, I'd continue to train and develop the IS staff to take over when the Amdocs development is done. You don't want to entirely trust the business to outsiders, especially when they are partly owned by a competitor," the staff member said.



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Goodyear cuts IS work force

AKRON, Ohio — Goodyear Tire and Rubber Co. announced last week it will slash 1,100 white-collar jobs from its work force and cut capital expenditures 39% from 1990 levels. However, the effect this restructuring will have on the information systems department was not clear to company IS officials last week.

"We don't know how the [reductions] will happen . . . by attrition or what," said Nick Guistino, manager of information services at the tire company.

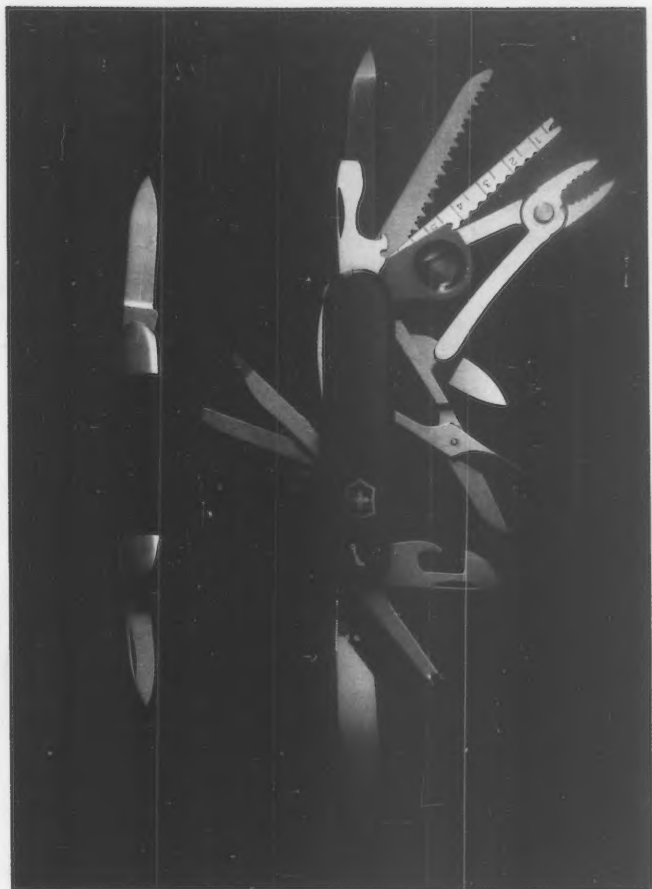
Goodyear has said the job reductions and other cost containment measures will amount to a savings of \$165 million annually by 1992. In addition to announcing the staff cuts, Goodyear said last week its capital expenditure budget will be reduced to \$350 million, down from the approximately \$450 million it had planned to spend this year.

Since January 1989, 12,000 positions, or more than 10% of the work force, have been eliminated at Goodyear. Of these, 6,700 were white-collar jobs. Guistino said these earlier cuts had meant only a handful of attrition reductions in the centralized operations and systems support staff, which today has about 225 people.

Goodyear's programming staff reports directly to Goodyear's eight business units (five for tire and three for general products) and reflects the decentralization of the function that occurred several years ago.

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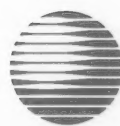
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ADVANCED TECHNOLOGY

Fighting your battles in a world of the future

Battletech uses technology once limited to military flight simulators in a war game arena for the populace

BY ELLIS BOOKER
CW STAFF

"Left! Go left! They're on your tail!" Sure enough, my radar screen plainly shows an enemy Battlemech with its hideous array of weaponry — ranging from machine guns to particle projection cannons — trained on my back.

Instinctively, I try to use the joystick in my right hand to swing around to confront my attackers, even as the sound of explosions engulfs my "pod." My pod is a closed compartment containing a "radar" screen, a second color monitor displaying the battlefield as well as numerous lights and buttons for controlling advanced features.

Opened last August, the Battletech Center in Chicago is as close as most citizens are likely to get to experiencing a military flight simulator. For \$7 for 10 minutes of play, up to eight people — or two teams of four — enter a compelling virtual reality set in the year 3028. Once shut into individual pods, players find themselves on a 100-sq-mile desert plain spotted with boulders and some leafless trees — an ideal locale in which to blast any opponent.

You and your opponents are in command of Battlemechs, not so much a tank as an H.G. Wellsian nightmare: a 30-foot-tall, walking robot containing a human driver.

Each cockpit is equipped

with a Motorola, Inc. 68020 CPU, a memory board with 32M bytes of random-access memory, a scaling board for geometric computations, a sound board featuring a number of processors for both synthesized and sampled sound, and a Commodore Business Machines, Inc. Amiga 500 computer. A Datapoint Corp. Arcnet network, with a few 25-MHz Intel Corp. 80386-class computers attached, ties it all together.

But won't home computers, equipped with next-generation graphics and sound soon be able to duplicate the Battletech experience?

"At some point in the future what we offer here will be repeatable in the home environment," acknowledged Ross Babcock III, who created the game along with Jordan Weisman. "We'll be ahead by then. We see ourselves in the three- to five-year gap between the time this technology leaves the military simulators and ends up on the home market."



The Battletech simulator brings you face-to-face with a variety of well-armed foes

Like all good magic, the Battletech Center prompts a willing suspension of disbelief from the moment its audience arrives. While players wait their turn, for example, they can walk around a 4,000-sq-ft space to an "observation deck" where screens show what each player views from inside his Battlemech. Meanwhile, screens feature canned news reports with descriptions of recent battles or political events from the Battletech universe.

Even the architecture of the Battletech center — heavy on metallic-looking walls and bulkheads with radiation danger signs — works to support the illusion.

The two creators emphasize the importance of having programmers who understand the goals and "feel" of the simulated world. The game's programming was done by a local freelance firm, but a three-person, in-house software department will gradually take over coding.

How's the game? At close quarters, incoming Battlemechs can jerk about and disappear briefly from the screen, an artifact that next-generation software should address.

The game requires you to toss out your experience with arcade-style joystick controls.



Connected 'pods' let teams compete inside a virtual universe set in the distant future

My own mistake was to depend on the joystick for movement control. In this simulation, two-foot peddles govern direction; a throttle under the left hand controls the speed of the tank.

Weisman and Babcock said they hope to open four more "virtual world" centers by the end of the year and another eight centers next year. They plan to link centers using telephone lines, allowing players in different cities to conduct tournaments.

Future centers will move into other types of simulations, including a flight simulation due next summer.

After the assault on my back, I discover that my forward view is shifting hesitantly up and down. An instructor leans in over my shoulder and deftly hits a couple of keys, bringing up a schematic diagram of my damaged unit. "Yup," he says knowingly. "They hit your servo motors."

Bellcore database could make phone numbers last a lifetime

BY GARY H. ANTHES
CW STAFF

"Normally you send transactions to the database. We send the database to the transactions," said Gary Herman, a network systems researcher at Bell Communications Research, Inc., or Bellcore, in Morristown, N.J.

It is an elegant but simple explanation for a new database architecture developed by Bellcore, the research arm of the regional Bell holding companies. Called Datacycle, it may someday be used by telephone companies to assign unique, lifetime identifiers to millions of telephone subscribers. Calls could be made to a person's ordinary telephone number or addressed to his lifetime identifier or to a "vanity" number such as "BEST-

CPA-IN-TOWN."

Datacycle sends all of a database multiple times per second past an array of independent processors, each equipped with smart filters that pluck from the torrent of data just what is needed by that processor at that instant.

Because all data is read every cycle, the database does not have to be indexed or organized to support access to any particular attribute and hence can be application independent. The method also allows concurrent, read-only access to the database by any number of processors without interference among them.

Customers expect telephone companies to process large streams of telephone calls against huge databases in real time. One way to handle the work load is to add multiple processors to a system, but communica-

tions among processors limits overall performance. "The processors spend more time talking to each other than doing real work," Herman said.

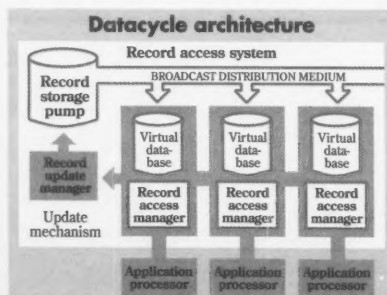
However, with Datacycle, all processors see the entire database and they see the same snapshot of it at any time, so interprocessor communication is unnecessary. By adding more processors, performance can be boosted essentially without limit to give subsecond access to any data element. "Once you pay the price of a fast, full database scan, the queries are free," Herman said.

In a Bellcore prototype, a centralized "record storage pump" broadcasts a 32M-byte database two times per second. Processors that read and filter the data are decentralized, but writing to the database is performed centrally by a

conventional processor.

The key to the approach lies in the data filters, Herman said. They are custom-built, very large-scale integration circuits that can apply Boolean selection logic to as many as 28 data fields at one time.

Telephone companies could use Datacycle to move large amounts of data quickly over fiber-optic cables from a central database to processors at switching offices many miles away.



Source: Bell Communications Research, Inc.

CW Chart: Marie Haines



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EDITORIAL

Under heavy fire

ON THE VIEWPOINT page three weeks ago, 3Com founder and Ethernet inventor Bob Metcalfe — with tongue planted firmly in cheek — suggested that Microsoft be investigated for violating any number of federal anticompetitive rules.

Few at the time knew that the Federal Trade Commission was doing exactly that — and had been since last summer. Some software companies last week reported they were first contacted about six weeks ago by the FTC in connection with the investigation Microsoft confirmed last week (see story page 1).

To date, the inquiry has reportedly been confined to a November 1989 press release from IBM and Microsoft in which the companies tried to make a case for customers' buying OS/2 while placing limits on the scope of Windows.

The genesis of the investigation may never be known, but there's no shortage of Microsoft competitors dancing on the ceiling at the prospect of what such an inquiry might yield.

The grudges harbored against Microsoft run deep and center on strongly held beliefs that Microsoft:

- is too powerful (it is, but that's not necessarily illegal).
- willfully misled applications developers down an OS/2 dead end (good luck proving the willful part).
- maintains a proprietary lock over the desktop computing standard — MS-DOS — at a time when customers are demanding "open systems," and much of the industry is rushing to line up under such a banner.
- restrains fair trade by making vaporous product announcements about everything from applications to desktop publishing software to pen-based operating systems just to cheese off its competitors and create fear, uncertainty and doubt.

The last allegation was used in the past against IBM, and successfully so, as Metcalfe noted.

Whatever the outcome of the current investigation, we are sure to get at least a kangaroo court-style hearing on one key question: Should Microsoft's burgeoning business be split into two, if not more, distinct businesses?

Microsoft could greatly reduce the likelihood that this debate will ever develop by essentially imposing on itself, and convincing the software development community that it adheres to, the same ilk of rules the feds imposed on IBM to stop its bundling practices. That is, treat the applications and systems software businesses as though they really are separate.

Microsoft has long claimed such a separation exists, but few competitors have ever taken that assurance at face value. The company obviously has to go further to embrace outsiders in the development of MS-DOS and Windows, in other words offering some of the input and access that an official standards body provides. Failing in this type of active appeasement just might prompt discussions that would soon point to a most inappropriate action, and that is punishing a company for the very success it has earned.



LETTERS TO THE EDITOR

Mixed blessings

I read the article titled "CA users fume over new fees" [CW, Feb. 4] with mixed feelings. While I would rather not spend my company's money to move to VSE/ESA, I think the technological ramifications of VSE/ESA were glossed over in the article.

Users have waited for VSE to become "strategic" again for a long time. Now IBM has done this, stating quite clearly that VSE/ESA is entirely new. To quote IBM documentation, "VSE/ESA is a replacement for VSE/SP."

The most important issue here is that IBM has delivered this long-awaited and well-received operating system, and my CA software exploits its capabilities today and in the future. Additionally, some of the restrictions that VSE/ESA has in what can run in the new dynamic partitions have been removed by the use of CA products.

George Rodriguez
AVP, Technical Support
Capital Bank
North Bay Village, Fla.

CA responds

In response to recent references in *Computerworld* [CW, Feb. 4, 11, 25] to the Computer Associates policy with respect to the operation of our VSE software products under the new VSE/ESA operating system, allow me to clarify the following:

- All of our VSE software products already support VSE/ESA.
- All of our VSE products can be run under VSE/ESA without payment of any additional license or maintenance fees.
- We have developed for certain of our VSE products chargeable

but optional ESA modules that exploit the substantial increase in functionality offered by VSE/ESA.

CA regrets any confusion created by mistaken reports of our policy given our record of software achievements enhancing the VSE environment, our commitment to our VSE clients and our enthusiasm over the advanced capabilities presented by this computing environment.

Charles B. Wang
Chairman and
Chief Executive Officer
Computer Associates
International, Inc.
Garden City, N.Y.

People power

With the phrase "... people are our most important asset" ringing in my head, I read with great interest how the six surveyed directors of information systems would spend an extra million dollars [CW, Dec. 24/Jan. 1].

As H. Ross Perot said recently, "Developing people exceeds the value of capital expenditure 10 times out of 10."

Richard Hammond
Consultant
Hammond, Glandon &
Associates, Inc.
Baltimore, Md.

Unix endorsed

Myth four, "Unix programmers are flaky, scarce and expensive," in Mr. Ozsvath's article in your Feb. 11 issue is very amusing.

Our firm has specialized in Unix software services since 1983. We believe there are about 250,000 Unix programmers out there, of whom we have about 60,000 in our database. Based on personal experi-

ence, these are highly professional, creative people.

I heartily endorse Mr. Ozsvath's statements regarding the cost savings realized by developing applications under Unix.

Jonathan Wallace
Vice President
Pencor Systems, Inc.
New York, N.Y.

Are we blushing?

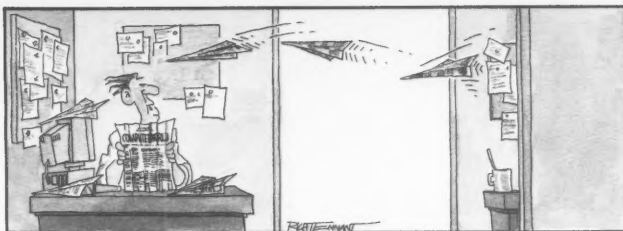
The training article "Business as usual for disabled" [CW, Feb. 11] leads off with, "At first blush, training disabled people to become productive information systems professionals may seem to pose unique challenges."

You must have lost most of your audience from the "git go" I'm afraid. As a nondisabled professional, on behalf of my challenged colleagues, I must take exception to the format chosen to begin what turned out to be a reasonable, informing article.

At first blush! Is that some esoteric, new-age term with which I am unfamiliar, or are you insinuating it may be embarrassing for your reader to be associated with, coordinate training for or look at the disabled IS professional? I hope to heaven the latter was not meant.

Karen Lee Cocks
Programmer/Analyst
South Portland, Maine

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.



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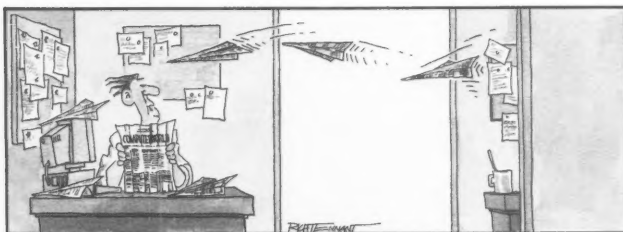
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 20. Finance/Insurance/Real Estate
 30. Medicine/Law/Education
 40. Wholesale/Retail/Trade
 50. Business Service (except DP)
 60. Government - State/Federal/Local
 65. Communications Systems/Public Utilities/Transportation
 70. Mining/Construction/Petroleum/Refining/Agric.
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
 90. Computer/Peripheral Dealer/Distrib./Retailer
 95. User/Other _____
 99. Vendor/Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
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 21. Dir./Mgr. MIS Services, Information Center
 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
 23. Dir./Mgr. Sys. Development, Sys. Architecture
 31. Mgrs., Suprv. of Programming, Software Dev.
 32. Programmers, Software Developers
 60. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
 11. President, Owner/Partner, General Mgr.
 12. Vice President, Asst. VP
 13. Treasurer, Controller, Financial Officer
 41. Engineering, Scientific, R&D, Tech. Mgt.
 51. Sales & Mktg. Management
OTHER PROFESSIONALS
 70. Medical, Legal, Accounting Mgt.
 80. Educator, Journalists, Librarians, Students
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3. **COMPUTER INVOLVEMENT** (Circle all that apply)
 Types of equipment with which you are personally involved either as a user, vendor, or consultant.
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 D. Communications Systems
 E. Local Area Networks
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Down with yuppie marketing!

It's time for facts, not fluff, and teamwork instead of ego padding

DENNIS COLEMAN



Something stinks in the U.S. technology marketing culture. It grows in the detritus of the 1980s and is called yuppie marketing. Eventually, natural selection will replace self-serving yuppie marketing with team-serving real marketing, but we should accelerate the process.

Having caught some obvious waves during the go-go '80s, yuppie marketers feel they have "the touch." When the surf is down, however, these folks are not a pretty sight. They don't know what to do, except complain about recession, push perfunctory standards, try to avoid layoffs and hope for the best.

Yuppie marketers won't be able to hold onto their grandiose job titles for much longer. Their philosophy of mindless consumption is simply incompatible with the competitive and even hostile landscape of technology business development in the 1990s.

Foreign competition prays that the U.S. marketing machine remains stuck in its current rut, because our malaise effectively allows them to eat our lunch. But we don't have to answer these prayers. We don't have to be perfect to win, either. We just have to recognize the need to cleanse ourselves of certain bad marketing habits such as groundless optimism, hype reflex, tendencies to blame the other guy and avoid risk and a shallow preoccupation with personal wealth, status and early retirement.

Through applied marketing science, self-denial and mental conditioning, U.S. technology marketers can stop, and maybe even start to reverse, the erosion in our competitive position.

Real marketing is macho. It relishes

teamwork and increasing value for both client and shareholder. It seeks position, not short-term revenue. It is brutally honest and brings bad news as reliably as good news. It reports the real business situation, justifies the product direction, clarifies un-



David Brin

certainties and calls for sacrifices to meet market requirements. It is objective enough to cancel a losing effort (even to the point of laying itself off) and leave a winning one alone.

Real marketing has nothing to do with ownership of upscale cars with phones and custom license plates or with compensation, titles and office sizes. Its actions are not fluff-based. They concern real things such as strategies, products, tactics, resources, market share, quality and forecasts.

A number of tell-tale signs indicate the presence of yuppie marketing. Puckered skin and watery eyes from repeated hot tub and white wine exposure are usually dead giveaways. But there are also some more subtle signals:

- The marketers

don't know who the clients are or what they are doing with the products.

- The marketing plan has no downside other than sales not trying hard enough.

- Marketing is afraid to pull the trigger, track progress against plan, take profit and loss responsibility or participate in postmortems of lost opportunities.

- Marketing avoids messy issues such as irate user groups, product damage control and quality assurance.

- There are more consensus-building meetings on a given marketing question than relevant attendees.

- The marketing plan needs more than 10 pages to document or three dimensions to present.

Second-generation technology purchasers won't be fooled again by the chorus line approach of yuppie marketing. Businesses will avoid suppliers whose strategy only seeks maximum payment for minimum value. Buyers will gravitate to products from companies that understand and practice real marketing.

Real marketing is America's secret weapon. Let's use it before it's too late.

Coleman is a technology marketing consultant based in Half Moon Bay, Calif.

Belt getting tight? Try these exercises

MICHAEL COHN



Times are hard. Money's tight. Chief financial officers are brutally slashing information systems expenses. You've probably been asked to do more with less — less MIPS, less DASD, less bodies and less sleep.

All is not lost. With a little creativity, you can find ways out of this mess. Here are some ideas on how to get by on a microscopic budget:

- **Teach your folks to share.** Quit spoiling your staff. In the old days, we all stood in line at one card punch machine. You can get by with just one terminal for every three programmers. No one will complain; they'll be too busy fighting over the department's only keyboard.

- **Too drastic?** Okay, try this. Monitor idle terminals. If one sits quiet for half an hour, remove it. You'll be amazed how often no one touches a terminal for 30 minutes — especially because response time is usually about 40 minutes.

- **Make your users do more.** Look, most users are already trained to fetch reports from

bins outside the computer room. So why not let them in to burst and sort the stuff themselves? What's wrong with that? And as long as they're back there, is there any harm in asking them to mount a tape or two? I'll bet a few could even pick up Pascal, with a little encouragement. Pretty soon you'll be able to cut back on coders.

- **Manage smarter.** Small budgets can still get big results, if you manage your people right. Make them more productive. Stroke them. Support them. Show them you're behind them 100%. Better yet, show them you're behind them 100% holding a very pointed stick.

- **Make IS a profit center.** Too many executives see IS as an expense. You can change that. Deploy technology in your enterprise so that it not only saves money but makes money.

Push competitive advantage. Create a strategic IS plan. But just to be on the safe side, toss in an IS bake sale, and send your staff around desk to desk with some of those big candy bars for a buck.

- **Buy used.** Why insist on new equipment? Why pay top dollar? In hard times, find hard bargains — buy used.

A lot of used equipment is as good as new. Of course, a lot of used equipment is also junk. The main thing to remember is, if you buy used computers that don't work, you should also make sure to buy used beepers that don't work.

- **Streamline.** Cut the fat out of IS. It's time to run lean and mean. Reduce your staff to the minimum mix of essential IS professionals.

This might panic the whole department, so be fair. Give each employee careful thought, evaluation and consideration. Then break the news gently. Call everybody into a big room, line up a handful of chairs in the middle, and start the music. Everyone will get the idea.

- **Prioritize.** Everyone can't have everything anymore. Sit down with your users and prioritize projects and fixes. Divide everything into the nice-to-haves vs. the must-haves. Then prioritize the must-haves into the need-it-nows vs. the needed-it-yesterdays. Separate the needed-it-yesterdays into the somehow-got-by-without-it vs. the I-can't-wait-anymores. Finally, split the I-can't-wait-anymores into the skip-it-it's-too-lates vs. the forgot-what-it-was-in-the-first-places.

By the time you've finished, no one will be looking for anything — so you can send everyone home early.

Cohn is trying to be a computer salesman in Atlanta.

Always bringing up the rear

READER'S PLATFORM

HELMAR B. HERMAN

Like the famous comedian, "I don't get no respect."

Twenty-two years ago, I started out as a systems programmer on an IBM 360 Model 30 using DOS Release 16 in an assembler language shop. For a few years, I was in unenlightened bliss.

My feelings of inadequacy began when I found out that our sister company ran OS, a "real" operating system, on a Model 50! I saw all of the "neat stuff" (that's how we talked back then) that OS could do and began to be a little ashamed of my beloved DOS (never mind that I could run three partitions using only 8K of core for the supervisor!)

Then, my PSR (Remember those? Back then, IBM had guys who would come out, roll up their sleeves and really help you!) told me that PL/I was the language of the future. Assembler seemed to lose its luster. Even Cobol seemed somehow more glamorous.

Things progressed in this manner from year to year. VM was coveted and finally acquired. We even managed to be one of the first in some things. DOS/VS and VSAM were installed and used heavily as soon as they were available, so I felt right on top of the world for a while. Nev-

er mind that VSAM under OS/MFT allowed things such as user catalogs.

Even in recent years, when I finally got to work on OS (now called MVS), it was only the SP version. I sure wanted to try that XA version! Deep in my heart, however, I still preferred working on our VSE system. It fit like a warm comfortable sweater. It didn't have the tendency to do things for, or to, you.

Now I work for a fun new company, on a personal computer, developing programs for our desktop Magnetic Ink Character Recognition laser printer. I still find myself defending my "archaic" language (I use Microsoft Quickbasic) against our hotshot C programmers. "No, it's not just a beginners language." "No I don't use GOTO's and single-character variable names!"

I've even come full circle on my operating system. Yes, I'm back to using DOS. No, we haven't yet converted to OS/2, AIX or even Microsoft Windows.

When am I going to pick a component to use that will place me, even briefly, at the leading edge of my art, to the envy and admiration of all my peers?

By the way, my car isn't so bad either. Have you ever really tried driving a Yugo?

Herman is director of product development at Bottomline Technologies in Exeter, N.H.

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Tom Harper, BMC corporate architect, covers the *"Past, Present and Future of Data Stream Optimization"*

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SYSTEMS & SOFTWARE

COMMENTARY

J. A. Savage

Open system reality check



There's hope: The recession won't hit the company and you'll still have those nifty bonuses and a big fat expense account. Then there's reality.

There's hope: Unix-based computers are cheap. Unix International and the Open Software Foundation (OSF) promise to narrow down the myriad flavors of that standard operating system to two so you can run most applications between cheap computers without having to port them.

Then there's reality — or shades of reality.

Sure, in the mid-1990s there may be only two dominant flavors of Unix. But between now and then, vendors such as Hewlett-Packard, Sun and NCR are working furiously to write layers of software — many, many layers of software — to add to the Unix equation.

Consumers won't be picking between the OSF and Unix International. Go ahead, pick one or the other, but then you'll be faced with an avalanche of acronyms — layers of software — from which you must also choose.

The acronyms are not applications but lower levels of software that allow the Unix operating system to do such things as share files, manage objects and seek out free MIPS, among other operations. By the time the OSF and Unix International have their vanilla operating systems,

Continued on page 32

RS/6000 grabs attention of S/36 users

BY MARYFRAN JOHNSON
CW STAFF

As IBM's System/36 lumbers down the road to extinction, the search for alternative computing power is pulling some users in a direction IBM may not have anticipated.

These customers are rejecting IBM's push toward its proprietary Application System/400 and shifting their gaze to the Unix-based RISC System/6000 instead.

One prominent example is the Marriott Corp. hotel chain, which last week moved its first RS/6000 into the accounting department at the Marriott in Greenbelt, Md.

"We are pleased with what we see so far. If somebody is looking for speed, this is it," said Michael Klein, information systems manager for hotel accounting systems.

Marriott has clocked in per-

formance gains seven to 10 times greater with the RS/6000, while a move to an AS/400 would have only doubled the performance of the System/36 at a much greater cost, Klein noted. "If the performance works out the way we expect, there is no reason we couldn't go to more of them."

The hotel chain still has 130 System/36s running an internally developed accounting application written in RPG-II. To move that application from the System/36 to the RS/6000, Marriott used Unibol/RPG-II, a bridge language compiler from Software Ireland Ltd. in Belfast, Northern Ireland. The compiler is distributed in the U.S. by Arccom Support Group, Inc. in Marietta, Ga.

Alternate route

- A survey of 368 System/36 users by Elms Technical Communications shows that only 2.4% of those questioned have purchased or plan to purchase a RISC System/6000
- There are now about 100,000 System/36 installations in the U.S.
- Projecting the Elms survey results out over the base of 100,000 systems shows only 2,400 users moving to the RS/6000, although Elms reports that trend may accelerate as software vendors add migration aids

Source: Elms Technical Communications
CW Chart: Marie Haines



the way we were used to it," Klein explained. "Unix is effectively masked from my users. Eventually, we will rewrite the whole package under AIX [IBM's brand of Unix], but in the meantime, the Unibol gives us a nice bridge."

Applications specific

Users finding such a move attractive seem to be those with single applications in industries such as health care, retail, professional services or manufacturing, said Teresa Elms, president of market research firm Elms Technical Communications in San Diego.

In a recent survey of 368 System/36 users, Elms found 2.4% had purchased or were planning to purchase an RS/6000. While the numbers are far from overwhelming — out of 100,000 System/36 owners nationwide, 2.4% tallies to only 2,400 users

Continued on page 32

Users not quite ready for Ultimate upgrade path

BY JOHANNA AMBROSIO
CW STAFF

EAST HANOVER, N.J. — Pick may be the operating system's name, but Unix is now the game for users who said they are looking forward to blending Pick with Unix, only not right away.

Users said that merging the two environments allows them to keep their applications written in the Pick database environment but add communications and other Unix features. It also allows users to adopt newer Unix-based hardware and forsake the proprietary Pick com-

puters they have been using.

One way to do this is with a new operating system from The Ultimate Corp. in East Hanover, N.J. Called Ultimate Plus, it allows users to run their Pick applications on top of AT&T's System V Release 3 operating system as well as IBM's AIX. Ultimate Plus will be generally available next month for the Hewlett-Packard Co. 9000 series, with other implementations to follow. Users need to license the hardware vendor's Unix implementation and then put Ultimate Plus on top of that.

Ultimate Plus joins the half-

dozen or so other Unix/Pick blends on the market, among them Advanced Pick from Pick Systems in Irvine, Calif., and Universe from Vmark Software, Inc. in Natick, Mass.

Michael J. O'Donnell, chairman of Ultimate, said his company's Unix/Pick blend does not require any conversion effort from current Ultimate users, but it may require one week or so of conversion for non-Ultimate customers. Also, he said, some of the other Unix/Pick implementations "look more like Unix than they look like Pick — they don't have the functionality of native Pick, and ours does."

Users, for their part, said that while they welcome another upgrade path, some may not take advantage of it for quite some time. Diane Cowley, a senior systems analyst at Bar-S Foods

Co. in Phoenix, said, "It's something we're looking at. In about two years, when we need a new machine, we'll look into it."

"It is difficult to connect Pick systems with other computers, and Unix will help solve this," said Victor Roa, a systems analyst at L. V. Myles, Inc., an apparel manufacturing company in New York. "A lot of people are looking forward to this."

Still, according to Roa, his firm is not quite ready to make the move. "We're still in a wait-and-see stage," he said. "We have no plans to modify our hardware; when we do, we will hope there will be more choices, and what's out there will be fully tested."

O'Donnell said, "We don't expect everyone to move today. Over the next couple of years, though, they'll have to move."

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A USER'S CHALLENGE:

A telecommunications company recently faced a budget dilemma that was forcing its IS executives to look beyond IBM for its next mainframe. With several System/3090s installed, the company's IS management did not want to add an IBM-compatible CPU supplier. It was especially worried about the impact a different mainframe — with its new people, procedures and culture — might have on the operations and systems development groups. To close the million-dollar gap that existed between a new 3090 and the non-IBM alternative, the company turned to the quiet, invisible and reliable Cambex solution. It replaced over a gigabyte of IBM 3090 memory with Cambex STOR/9000 central and expanded memory cards, and was able to generate more than enough funds to buy another 3090. Find out more about this clever user from your local Cambex sales representative.



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NEW DEALS CA wins customs contract

The U.S. Customs Service has awarded a software services support contract to **Computer Associates International, Inc.** based in Garden City, N.Y. The contract is potentially worth as much as \$27 million to the software vendor during a five-year period. Under the terms of the agreement, CA's Professional Services Group would support the U.S. Customs Data Center in several areas.

Japan Air System, an international airline carrier, recently signed a \$70 million contract with **Blue Bell, Pa.-based Unisys Corp.** A longtime Unisys customer, Japan Air will purchase two Unisys 2200/633 mainframes, seven 2200/400 mainframes and 18 DCP/50 distributed communications processors. In addition, the contract provides for the Unisys USAS 2000 system of passenger services software, which is used for seat inventory and airport check-in as well as hotel and reservation support activities.

ITA Inverse Theory & Applications, Inc. has installed a **Convex Computer Corp.** C220 supercomputer for research and development of seismic data processing software. ITA, located in Calgary, Alberta, has also announced an OEM agreement with **Convex** whereby ITA will market its seismic processing software on the Convex supercomputer to ITA customers on a worldwide basis.

Coin, Inc., an Atlanta-based automotive computer company, has signed an agreement with **Universal Underwriters Insurance Co.** in Overland Park, Kan., to develop an electronic information system for transferring data directly from automobile dealerships to Universal. The interface is slated for delivery by 1992, according to a Coin spokesman.

Houston switches from IBM

Amdahl replaces Big Blue as main hardware vendor in city's IS group

ON SITE

BY JEAN S. BOZMAN
CW STAFF

HOUSTON — In an almost clean sweep of IBM equipment, the city of Houston removed nearly all traces of IBM's five-year stint as the city's primary provider of computer equipment.

Late last month, Houston replaced an IBM 3090 Model 180 E, which it had outgrown, with a new Amdahl Corp. 5995 Model 350. The city also replaced 52G bytes of IBM disk drive capacity and an IBM 3725 communications controller.

"IBM had questions about our evaluation process. They said the city was sacrificing an excellent business relationship with IBM," said Zanna Stepanek, head of Houston's 170-employee Information Services Division and assistant director of the General Services Department.

"However, IBM's bid was substantially more expensive [than Amdahl's]," she said. One key in the \$3 million deal was Amdahl's acceptance of the IBM

3090 180E as a trade-in item.

"Some static came with the decision," Stepanek admitted, "but competition is healthy." Houston made the move after conferring with information systems managers in the Texas cities of Austin and San Antonio, which are Amdahl shops.

IBM appealed the division's recommendations to the 14-member city council, which approved the Amdahl bid. IBM declined to comment.

"Our decision was based on price and performance," said John Regus, manager of technical support at the Information Services Division.

Little IBM gear remains

The Houston computer room change left only four IBM 3420 tape drives and a few IBM terminals as reminders of the five years in which IBM equipment dominated the city's primary computer shop, Regus said.

IBM bid an air-cooled IBM Enterprise System/9000 rated at about 30 million instructions per second (MIPS), sources said. Amdahl's 5995 machine has about 35 MIPS, the sources said.

The installation of the Am-

dahl mainframe and 90G bytes of disk storage was part of a broader move to update Houston's computer systems, Stepanek said. "This will give us great flexibility in the future," she said. "We have a clear upgrade path to a [5995] Model 500 or 700, which we could do with a series of board swaps." The city had been frustrated with a more difficult upgrade path from its 3090 to high-end IBM ES/9000s, Stepanek said.

Currently, the city is working to consolidate a variety of inherited systems, including aging Bull HN Information Systems, Inc. DPS 6 machines used by the

fire department, a DPS 8 at the Amdahl site and a Unisys Corp. 1100 mainframe used by the police department. Programmers are converting data from a Bull HN payroll system for use on the new Amdahl machine.

By building on a single database structure based on Software AG of North America, Inc.'s Adabas, Stepanek said she hopes to have programmers write new applications once and then launch them on multiple hardware platforms. Later, Houston may buy Amdahl's Unix operating system, UTS, to anchor Unix-based applications used in city agencies, she said.

Stepanek's next planned purchase is Amdahl's Multiple Domain Feature option, which will partition mainframe resources under IBM MVS into separate test and production machines.

D&B's Viewbuilder satisfies beta-test user

BY SALLY CUSACK
CW STAFF

FRAMINGHAM, Mass. — When Dun & Bradstreet Software rolled out its IBM workstation-based development tool, Frontline Viewbuilder, last October, interested users and analysts took a wait-and-see approach.

"We were a beta tester for the product, and we received the controlled release about three weeks ago," says Michael Coxhead, vice president of MIS at JMB Properties Urban Co. in Chicago.

The largest real estate syndicator in the country, JMB has used the Frontline tool to create 10 applications, three of which are used for production.

Frontline Viewbuilder is a personal computer-based tool designed to build stand-alone or cooperative processing applications. It can communicate with any host hardware using a 3270 communications environment as well as Digital Equipment Corp. VAX machines.

Coxhead, who runs the package on an IBM Personal System/2 Model 80, characterized the product as "one of the most powerful tools" he has ever worked with, adding that he also explored Microsoft Corp.'s Windows-based technology as a possible development solution.

JMB, a Dun & Bradstreet Software Millennium shop for seven years, used Frontline to develop a conversational security application to operate in conjunction with the company's

IBM 4381 under the IBM VM operating system.

The security application maintains and updates security files on Millennium products and the operating system and links to the mainframe via an Irma card, Coxhead said.

There are approximately 150 to 200 registered users on the mainframe, which uses DOS guest machines under VSE, and all communications are over di-

CASE use draws questions

BY MAURA J. HARRINGTON
CW STAFF

LOS ANGELES — Information systems managers remain interested in computer-aided software engineering (CASE), as proven by the turnout of between 2,000 and 3,000 people at the recent CASE World Conference & Exposition, but buying into the technology is another matter.

On the showroom floor, IS managers and industry experts expressed doubts as to whether a full CASE strategy is a cost-effective solution for them at this time. They attributed their uncertainty to the lack of industry-wide CASE standards and their inadequate knowledge of the technology.

Gary Jensen, a systems manager at Coors Ceramics Co. in Golden, Colo., said he has been looking unsuccessfully for more than three years to implement "the perfect CASE tool that will generate my code from start to finish" into the company's Digital Equipment Corp. VMS system.

"I'm not sure that there is any one [vendor] that really has a

handle on CASE yet, so we are now evaluating whether to build our own CASE tools or modify off-the-shelf products," Jensen said.

It takes three years from the initial investment to fully implement CASE into an information architecture, according to industry analysts. The managerial and executive-level commitment to the project is also necessary for success, experts said.

Mark Royer, president of Futuresoft, Inc., a San Diego-based consultancy specializing in CASE technology, said although IS managers often know what they want in CASE tools or designs, they do not know how to fit the technology to their needs.

Glorie Bryant, a staff analyst at the California Department of Water Resources in Sacramento, agreed. She said that being new to the field of CASE, the water department was unaware of the investment and methodology strategies needed to implement CASE.

"We are definitely going to implement CASE into our Unix system, but it's a matter of what solution to choose," Bryant said.



D&B Software's Frontline Viewbuilder

- ▶ First installed in 1990
- ▶ A workstation-based development tool that allows users to build stand-alone or cooperative processing applications
- ▶ Runs on any IBM Personal System/2 or compatible
- ▶ Source language is C
- ▶ Priced from \$30,000, which includes first-year maintenance

CW Chart: Paul Mock

rect and dial-up 9.6K bit/sec. lines.

The company has also used Frontline to downsize the mainframe property management application to run in a PC stand-alone environment and relies on the product in several other applications development areas.

One of the product's biggest advantages lies in its ease of use, Coxhead said. He estimated that the average programmer or analyst can use the software effectively within one week.

Frontline, which is written in C, provides a common user access as well as pull-down menus, pop-up windows with choice lists and Help facilities.



Doubt has an office. Anxiety has a key to the Ambition and a lunch date with Paranoia. And me, our PBX works as consistently as the tides. And just as who just happens to be passing by my office at this That ring is a chorus of thousands of AT&T workers was a peerless decision...." And as the phone rings residual value in the industry. It's ready to grow like maintenance program unequaled...." But Blame looking for some other doorway to darken. Just as asking me if I had lunch plans.



*washroom. Insecurity has a stack of messages from I'm staring at my telephone celebrating the fact that I'm doing this my phone rings, and I say to Blame, time, I say, "Blame, you know what that ring is? reminding me that buying their **DEFINITY**® System again I say, "Blame, this system has the highest flowers in springtime and is supported by a didn't hear this last part, as he was down the hall well though, it was Advancement on the phone*



AT&T

The right choice.

HP to continue MPE V support

Group formed to concentrate on older operating system

Hewlett-Packard Co. said last week that it will not only continue to support its decade-old proprietary minicomputer operating system, MPE V, but it has also placed support under a new organization centered on enhancing the old operating system for maneuvers such as interfacing to new peripherals.

"Customer support under the Applications Engineering Organization is solely focused on our installed base," said Ann Livermore, application support division marketing manager at the Palo Alto, Calif.-based company.

Before the support switch, engineers for MPE V were also working on the newer operating system for the company's reduced instruction set computing computers, MPE/XL, according to Livermore.

HP officials are promising better, but not necessarily cheaper, support for the operating system because engineers will not be dividing their attention among different products.

HP estimates that over 40,000 users have MPE V.

J. A. SAVAGE

RS/6000

CONTINUED FROM PAGE 27

— the trend may accelerate as software vendors come up with migration aids to ease the process, she added.

"We are hearing about more midrange vendors paying to have research done because of their interest in the RS/6000," Elms said. "Most of these vendors would never have considered Unix of any kind until IBM legitimized Unix for the RS/6000. From the customer point of view, the machine is less expensive and a better performer than the AS/400."

One Canadian firm, Universal Software, Inc., has an unannounced product in beta testing now — an object-code-com-

patible System/36 emulator — that would execute System/36 binary code on the RS/6000, Elms noted. Another migration aid, offering conversion from RPG II to native C language, is available from The Parkside Organization in Dallas.

"People are basically going to make these decisions based on cost and available software," said Gene Gellman, president of Common, the midrange IBM user group.

Gellman's firm, Cyro Industries, is now examining the RS/6000 for a computer-aided design application.

Suitable replacement

"There are a lot of big companies with System/36s installed, and they are very much a candidate for an RS/6000," Gellman said. "They could keep an AS/400 or mainframe in the data center and replace all those [System/] 36s running manufacturing applications with an RS/6000 as an engineering workstation."

John Dunkle, president of Workgroup Technologies, Inc. in Hampton, N.H., said migration from a System/36 to the RS/6000 is "natural fallout" from the power of the Unix-based workstations and servers as well as the networking capabilities of AIX.

"Where the machine is being used for a single application only, the RS/6000 makes a real attractive platform for System/36 users," Dunkle said.

Savage

CONTINUED FROM PAGE 27

users will have more to choose from than the dozens of Unix operating systems available today, which bundle in all the underlying extras.

Vendors will eventually bundle in those extra layers of software so buyers won't have to pick and choose as if from a multi-entree menu. But unless all vendors agree to include hooks for the acronyms, such as distributed computing environment, in their bundles, then one Unix application will still not work on or take advantage of all Unix-based systems. And wasn't that the point?

Until the lower levels of software are bundled into unified Unices, the two Unices still have many of the same problems that the old Unix had. Users will still have to work hard to get cheap hardware to easily share applications. And when they are bundled into "value-added" packages, how different will that be from today's proprietary packages?

And it will probably only get worse. Vendors are determined to make money off of their software technology. So as hardware becomes more of a commodity, they are putting enormous effort into writing these software layers to make Unix sit up, speak and roll over — in addition to running programs. HP has offered Openview as a capacity monitor, task broker and visual user environment, among others. Those will eventually run under OSF/1. Sun has thrown out similar but different packages to run on its version of Unix and eventually Unix International. Other companies, such as NCR, have big Unix software teams.

There's hope: Open systems will make IS life easier.

Then there's reality.

Savage is a *Computerworld* West Coast senior correspondent.

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**GEORGIA WORLD
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Oracle users consider SQL*Forms alternatives

BY JEAN S. BOZMAN
CW STAFF

WASHINGTON, D.C. — Frustrated by the lack of user-friendly features in SQL*Forms, Oracle Systems Corp.'s premier tool for developing database query reports, many users are investigating personal computer applications that speed report development and feature easy-to-use graphical user interfaces.

The East Coast Oracle Users Group meeting earlier this month drew more than 500 users and showcased a number of SQL*Forms alternatives, including Oracle's Oraclecard interface for Apple Computer, Inc. Macintoshes and IBM Personal Computer compatibles. Many of the options, such as Oraclecard, run under Microsoft Corp.'s Windows 3.0.

Because the front-end query applications are based on the industry-standard SQL language, the same packages can also be used to access non-Oracle corporate databases.

"You're seeing an explosion

of front-end tools," said Warren Capps, president of the Mid-Atlantic Oracle Users Group based here. "People are losing the fear of being tied to a particular vendor because, in many cases, these tools are threaded to multiple database architectures," Capps said. Many large corporations already have Oracle and non-Oracle relational database management systems installed at the same sites, he added.

Too many users

The performance of a mini-computer-based SQL*Forms RDBMS application can suffer when too many users log onto the system. "Many data networks get killed because users are passing lots of data back and forth between the database server and the workstations," said David Kreines, a project manager at Educational Testing Service in Princeton, N.J., and past president of the International Oracle Users Group.

"Now you can use very good front-end tools to work with a limited amount of data requested

from the database server," Kreines added.

Mounting resource contention and increasing traffic on the local-area networks slows down response times in minicomputer-based RDBMSs. With client/server designs, the computing work load is more evenly divided, and performance improves. "You're downloading the processing to the PC so that your [Digital Equipment Corp.] VAX can be a database server instead of a screen painter," a user in Denver explained.

The Oraclecard interface, introduced in late January, gives users a screen that looks similar to that of Apple's Hypercard for the Macintosh. Oraclecard allows end users to build database query reports without a working knowledge of the SQL programming language.

"Oracle has a great database, and it also has hard-to-use front-end tools," one longtime user of SQL*Forms complained.

The Oraclecard interface automatically translates screen selections into working SQL code, Oracle said. Built on top of a program Oracle licensed from Spinnaker Software, Inc., Oraclecard runs on Macintoshes and PCs running Windows and MS-DOS.

Other front-end tools shown

included Borland International, Inc.'s Paradox SQL Link, JYACC, Inc.'s JAM development system and Gupta Technologies, Inc.'s SQL*Windows. There were also conversion programs to translate SQL*Forms Version 2.3 code to the 1-year-old

SQL*Forms 3.0 format, including ACE*Converter from Performance Technologies, Inc.

Another conversion product, Window*Port from LAN Design, Inc., moves SQL*Forms Version 2.3 programs into Gupta's SQL*Windows interface.

Two supercomputers debut

Models round out Cray Research's Y-MP line

BY ELLIS BOOKER
CW STAFF

EGAN, Minn. — Cray Research, Inc. recently unveiled two new supercomputers in its Y-MP line.

The new models, which have been designated Y-MP8E and Y-MP8I, feature the following:

- A new I/O subsystem for high-speed communications between the computer's central member and disk drives, networks and other peripherals.
- An enhanced solid-state storage device to speed access to large amounts of frequently used data.
- A reduction of semiconductor chips through increased systems integration.

The Y-MP, first introduced by Cray Research in 1988, is

now installed in almost 80 sites, a company spokeswoman said.

The single-chassis Y-MP8I, which can be configured with up to eight CPUs, requires less floor space and support equipment and has lower operating costs than previous Y-MP models, the company said. It costs between \$9.8 million and \$16.3 million, the vendor said.

Cray Research claimed last week that the dual-chassis Y-MP8E, with four to eight CPUs, is the most powerful, general-purpose supercomputer available. It is priced between \$15.3 million and \$23.7 million, according to the vendor.

Both Model Y-MP8E and Model Y-MP8I run Cray Research's Unix implementation, Unicos, and are scheduled to begin shipping in June.



Business software for Unix unveiled

MINNEAPOLIS — Commercial software vendor Lawson, Inc. recently unveiled its first line of applications for Unix platforms from IBM, Digital Equipment Corp., Hewlett-Packard Co. and Unisys Corp.

Lawson, which markets commercial software for midsize businesses, also announced a new product licensing program that allows customers to migrate their systems to different hardware platforms without additional fees.

The company's financial, human resources and distribution applications as well as its Universe/CASE and Universe/Report Writer tools are now available.

The products can be purchased for the following Unix-based operating systems: IBM's AIX; DEC's Ultrix Release 4.0; HP's HP/UX Release 7.0; AT&T's Unix System V Release 3.2 and CTIX Release 6.1-2 for Unisys S series machines, according to the vendor.

Unisys groups plan joint meeting

Former Burroughs and Sperry users hope conference will lead to merger

BY ELLIS BOOKER
CIVIL STAFF

Unisys Corp.'s two domestic user groups said recently that they will hold a joint conference in Denver this fall. Officials of the two user groups, Use, Inc. and Cube, said they hope this is a first step toward an eventual merger of the two bodies.

The groups have served different user bases since before

1986, when a merger of Burroughs Corp. and Sperry Corp. formed Blue Bell, Pa.-based Unisys. Use members are from the Sperry side of the house; Cube represents the former Burroughs side of Unisys. Each group claims approximately 4,000 members.

According to Use and Cube, discussions about a joint meeting have taken place for about one year and have been prompted by

vendor members looking for ways to control the cost of each group's annual conferences.

"We are also the only place in the world where the groups have not merged," Use President Alfred T. Hind said.

At the international meeting of Unisys user groups last year in Japan, both Use and Cube were challenged to look into consolidating their operations, according to Hind, who is manager of

technical development at South Carolina-based textile company Spartan Mills.

Hind said a committee of six, which will begin meeting at Use and Cube's spring conferences, will explore the idea of merging the two user groups. "We would like to have a merger down the line, but we'll leave it to the committee to sort out," he said. A combined group would obviously have a stronger voice in dealing with Unisys, he added.

Use plans to hold its Spring '91 conference in Chicago, April 22-26; Cube's next meeting will be in Anaheim, Calif., April 2-5.

NEW PRODUCTS — HARDWARE

Processors

Sony Microsystems Co. has introduced a dual-processor, high-end model of its News series of workstations.

The News 3870 is a workstation server that runs AT&T's Unix System V Release 4. It features a 25-MHz MIPS Computer Systems, Inc. reduced instruction set computing microprocessor that can reportedly yield 25 million instructions per second (MIPS). The system also incor-

porates a Motorola, Inc. MC68030 I/O processor that features speeds approaching 5 MIPS.

The workstation includes a set of X Window System protocols and can run the Open Software Foundation's Motif graphical user interface.

The product is priced at \$35,000 or \$40,000, depending on configuration.

Sony Microsystems
645 River Oaks Pkwy.
San Jose, Calif. 95134
(408) 434-6644

Codar Technology, Inc. has introduced a ruggedized computer that conforms to military specifications.

Model 700VME, part of Codar's Mil-Rel series, can be used as a shared-resource, multiprocessing environment that combines a Sun Microsystems, Inc. Sparcstation workstation with a VME system.

Prices range from \$40,000 to \$85,000, depending on system configuration and options purchased.

Codar Technology
2405 Trade Centre Ave.
Longmont, Colo. 80503
(303) 776-0472

Power supplies

The Emerson Computer Power division of Liebert Corp. has announced a line of three-phase uninterruptible power supplies designed for midrange systems such as the IBM Application System/400.

The Resource line includes four models that provide 10, 15, 20 or 30 kVA of power.

Pricing ranges from \$17,800 to \$24,300.

Liebert
1050 Dearborn Drive
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NEW PRODUCTS — SOFTWARE

Applications packages

Information Access Systems, Inc. has announced a software product designed to operate in tandem with news wire services to form a real-time natural lan-

guage news storage and retrieval service.

The Intelligent News System includes two modules: INS/Retrieve, which automatically categorizes and stores data for conceptual retrieval by untrained users, and INS/Distribute, which summarily distributes news sto-

ries to appropriate users and departments.

The software runs on Digital Equipment Corp. VAX/VMS and Unix System V-based machines. Prices range from \$15,000 for a single workstation version to \$95,000 for a shared system.

Information Access Systems
3340 Mitchell Lane
Boulder, Colo. 80301
(303) 442-6224

J. D. Edwards and Co. has introduced a wholesale distribution software package designed to function as a single information management system on an IBM Application System/400.

Distribution Resource Planning and Execution enables a wholesale distributor to perform integrated financial computing tasks while using one software program instead of relying on

several programs.

The product costs between \$125,000 and \$245,000, depending on the number of modules purchased.

J. D. Edwards
4949 S. Syracuse St.
Denver, Colo. 80237
(303) 843-1106

Utilities

Advanced Software Products Group, Inc. has unveiled Version 4.0 of Dasdtrack, a direct-access storage device (DASD) allocation product designed to monitor, control and account for the amount of DASD being used by any system at any given time.

The software runs on MVS-based platforms and is priced between \$12,900 and \$19,900, depending on CPU size.

Advanced Software Products
2335 N. Tamiami Trail
Naples, Fla. 33940
(813) 649-1548

Version 1 Release 4.0 of Xmap, Velocity Software, Inc.'s VM/XA and VM/ESA monitor analysis program, can be used to produce reports that analyze previously collected system performance monitor data, according to the vendor.

The product is said to allow direct-access storage device performance analysis reports from multiple systems to be combined to create a shared report. All irrelevant reports are automatically eliminated to assist users in focusing on key performance monitor information, the vendor said.

The program has an annual fee of \$3,000.

Velocity Software
1242 Wasatch Drive
Mountain View, Calif.
94040
(415) 964-8867

Development tools

Compuware Corp. has introduced an interactive testing and debugging tool for programming on IBM mainframes.

Xpediter/TSO and Xpediter/IMS 5.1 include flashback, a reverse execution facility that enables a developer to logically review a program's execution path by reversing directions as relevant data values are redisplayed.

The product is said to allow programmers to interactively control program execution at the source level. A quick-start feature provides programmers with the quickest possible entry into source code, according to the vendor.

Pricing ranges from \$20,000 to \$45,000, depending on CPU size.

Compuware
31440 Northwestern
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PCs & WORKSTATIONS

MICRO BITS

Microsoft joins group

Microsoft Corp. last week joined more than 100 vendors and users as a member of the Framingham, Mass.-based **Object Management Group**. The group develops specifications for implementing object-oriented systems and programming. Other members include **Digital Equipment Corp.**, **AT&T** and **Apple Computer, Inc.**

The Object Management Group last week also began soliciting information for an **Object Model** — a formal description of the behavior and characteristics of objects in an object-oriented environment. Object-oriented software facilitates applications development, maintenance and reusable software code.

Ventura Software, Inc., makers of Ventura Publisher, has made several pricing changes. Ventura cut the price of all **IBM Personal Computer** versions from \$895 to \$795. It announced user group evaluation copy pricing of \$75 for Ventura Publisher and Formbase 1.1. The firm also extended its \$75 rebate offer on all its product purchases made through April 15.

Desktop capacities packed into laptop disks

Portable personal computer users finally see signs of storage demands being met

BY MICHAEL FITZGERALD
CW STAFF

It is one of those dreams in which everything seems so real: A fast-talking sales guy with too-wide lapels on his double-breasted jacket is spewing the praises of his selection of portables. He pulls out a slender model and starts the spiel, with words and phrases such as "under six pounds," "SX" and "super-twist" getting heavy emphasis. Then he pauses, runs his hand lovingly along the side of the machine and beams as he drops his voice and says "and it's got a 60-meg hard drive."

In general, 2½-in., 60M-byte hard drives have been only a

dream, although several vendors had announced Intel Corp. 80386SX notebooks with them, and Compaq Computer Corp. was actually shipping a few — very few.

Users eager

Most users have been stuck with an anxious wait as problems with the new small drives troubled vendors such as Conner Peripherals, Inc. and Prairietek Corp. Now, however, the drives are starting to ship, and analysts said users are eager for the high-capacity, small form-factor drives.

"A sophisticated user is probably using the laptops the most, and those guys probably have 100M-byte drives on their desktop," said Jim Porter, president

of Disk/Trend, Inc. in Mountain View, Calif. Porter said that with today's increasingly powerful laptops, users now expect to be able to have the same information on their portables as they have on their desktop personal computers.

While the installed base of portable computers relies largely on hard drives with 40M bytes of capacity or less, Porter said, the trend toward larger drives has been accelerating during the past several years. Porter and Robert Abraham, vice president of Freeman Associates, Inc., a

Overdrive

Shipments of 2½-in. disk drives are expected to nearly triple from 789,000 in 1990 to almost 2.3 million in 1991

Capacity (in megabytes)	Worldwide shipments*
Below 30	1,003,000
30 - 60	1,010,000
60 - 100	230,000
100 - 300	40,000

*projected

Source: Disk/Trend, Inc.

CW Chart: Paul Mock

Continued on page 45

Lotus adds features, price cuts for Freelance

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. introduced a revamped **Freelance Graphics** for DOS Version 4.0 last week. It promised speed, ease of use and greater automation.

Taking a marketing lesson from spreadsheet rival Borland International, Inc., Lotus will offer a special \$99 promotion to existing **Freelance** and **Graphwriter II** users and users of products — such as **Software Pub-**

lishing Corp.'s Hardware Graphics and **Wordperfect Corp.'s Drawperfect** — through Sept. 30. The upgrade price will then increase to \$119.

Key improvements to the package, which retails for \$495, are said to include a new graphical environment with graphical what-you-see-is-what-you-get colors and fonts while you work, including support for the **Bitstream Speedo** technology; direct manipulation of charts and graphics (using mouse and graphical user interface-style

"handles"); presentation management improvements including more than 90 different background options; and new charting capabilities.

New charting features include three-dimensional XYZ charts, **Smart Chart Update**, autocharting, automatic data tables, expanded table charts and chart gallery symbols.

The **Smart Chart Update** automatically updates and redraws all charts, even those linked to outside data or with annotations.

Added features

Also provided is a customized version of **Symantec Corp.'s Grandview LT** program, which provides outlining and spell checking as well the ability to

create automatic text charts. It is included in the box and runs as a companion program.

Freelance for DOS is Microsoft Corp. Windows 3.0-compatible, and it will run from an icon in the Windows environment. **Freelance Graphics for Windows** will be available later this year.

Server and Node editions, priced at \$695 and \$395, respectively, will also be available.

Lotus also pumped up support for popular printers. Drivers for key devices, including **Hewlett-Packard Co.'s Laserjet III** and **Apple Computer, Inc.'s Laserwriter**, have been re-engineered to deliver substantial performance enhancements, the vendor said. The number of printers supported has also been increased.

APRIL 1991

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 **MOTOROLA**

NY Life gives recruits a multimedia look inside

ON SITE

BY RICHARD PASTORE
CW STAFF

WALTHAM, Mass. — "It's like nothing I've ever seen," bubbled applicant Frank Gioviniello last week after sampling New York Life Insurance Co.'s new multimedia recruitment program here. Such responses are gratifying to the team that spent one year grappling with the relatively untried technology.

Indeed, New York Life is one of the first companies, if not the first, to develop an application on Intel Corp.'s DVI multimedia platform completely in-house, an Intel spokeswoman said. Intel invited New York Life to show off its accomplishment this week at

Intel's booth at the Sixth International Conference and Exposition on Multimedia and CD-ROM in San Jose, Calif.

The recruitment application presents users with menus of information describing the company in general and the Boston office in particular. An applicant can click on various topic boxes and see video clips of agents and managers talking about how they came to work there and what it is like to be part of the company and office.

The Boston office staff members, who scripted and filmed

their parts themselves, went out of their way to make the application personal. In one video, general manager George Gordon tells how his wife has been an integral part of the business and shows off pictures of his kids. There are even "blooper" clips in which applicants' potential bosses flub their lines.

The application runs on an Intel 80386-based personal computer equipped with DVI full-motion video boards. The system is configured with a 720M-byte hard disk, which holds all the images, and a 150M-byte tape backup.

"It's fairly expensive for one application, but we feel strongly that it's going to be worth hundreds of thousands of dollars in time and labor savings," Gordon said. He said he expects the ap-



NY Life's Gordon even slips pictures of his kids on video

Apple offers low-cost printers, cuts PC prices

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. continued to make its product line more affordable recently with the rollout of a pair of low-cost laser-quality printers and broad price cuts across its Macintosh personal computer line.

Apple announced that it will decrease prices on midrange and high-end Macintosh models by as much as 31%. Apple will immediately lower prices on all models of the Macintosh IIFX, IICI and SE/30. A Macintosh IIFX with 4M bytes of random-access memory and a 160M-byte hard drive, for instance, will be cut \$2,300 to \$8,669. Similarly, a Macintosh IICI with 5M

bytes of RAM and an 80M-byte hard drive will be reduced \$700 to \$5,969, and a Macintosh SE/30 with 4M bytes of RAM and an 80M-byte hard drive will be lowered \$1,000 to \$4,999.

Seeks Classic success

The move seeks to duplicate the runaway success of the 5-month-old Macintosh Classic by applying a similar cost-cutting strategy to its low-end printers. Like the Macintosh Classic, the new printers were designed for small business and home users.

The Personal Laserwriter LS will be Apple's least expensive laser printer and will bear a list price of \$1,299, although retailers are expected to sell it for less than \$1,000. The Personal Stylewriter is a compact thermal

ink-jet printer weighing just 7.5 pounds. It will list for \$599 but will probably cost under \$500 when it hits retailers' shelves.

The machines will be made in Japan by Canon Ltd. and will be the first printers on the market to take advantage of Apple's new TrueType outline font technology. TrueType will be widely available later this year as part of System 7, Apple's next major release of the Macintosh operating system.

In addition, Apple also announced the immediate availability of A/UX 2.0.1, its latest version of the Unix operating system.

The update will be priced at \$995 for a floppy disk version and \$795 for a compact disc/read-only memory version.

lication to equal the duties of one to two full-time employees in the long run. It will also lend the office and company a leading-edge air in the eyes of potential recruits, he noted.

Uncharted waters

About seven months in the making, the system is basically a test for what New York Life executives said may become a companywide approach to development a few years down the road. At the outset of development, however, the company found itself up to its chin in relatively uncharted waters.

"Not all the tools were working right when we first started," said Angel Garcia, chief of the company's Emerging Technologies Group. Software bugs and limited outside support lent a beta-test feeling to much of the procedure, he said.

However, the obstacles proved "more challenging than discouraging," said John Malachuk, assistant vice president and training division manager. Garcia and Malachuk headed up a small team of New York- and New Jersey-based developers, including development specialist Carol Rutt. This group later brought the Boston office staff into the project. They all learned some lessons along the way.

First, they discovered a picture is worth a thousand words. Only a prototype demonstration could sell company executives on the technology's possibilities, according to Malachuk.

They also learned that costs are high for first-time multimedia development relative to other applications. The company spent about \$40,000 for the development hardware, software, training and video and audio equipment. The Boston general office spent another \$11,000 for the hardware platform to run it.

However, this outlay was considerably less than contracting for outside development.

Outsiders quoted figures as high as \$300,000 to develop an application that would run one hour, as this one does.

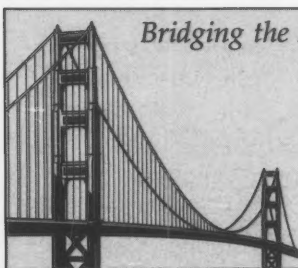
With the help of reusable code and the experience it has acquired, the same in-house team could knock out a similar multimedia application in one-third the time and at half the cost, Malachuk estimated.

Staffing also has to be approached differently. "You don't need people with heavy programming background," Malachuk said. "You need graphics and film experience and someone with a good voice." The firm happened to have an amateur disc jockey on staff.

A PICTURE IS worth a thousand words. Only a prototype demonstration could sell company executives on the technology's possibilities.

A stand-alone, single-station application now, the recruitment program will become much more powerful when it can be networked, said Tom Casey, senior applications project specialist in the Boston office. Intel is expected to announce this capability this week at the multimedia conference.

New York Life is already looking forward to its next applications, which will likely be in the area of employee benefits, agent training and marketing presentations for prospective customers. The recruitment program will also be tweaked, adding more options and flexibility to exit presentations before they have run their course.



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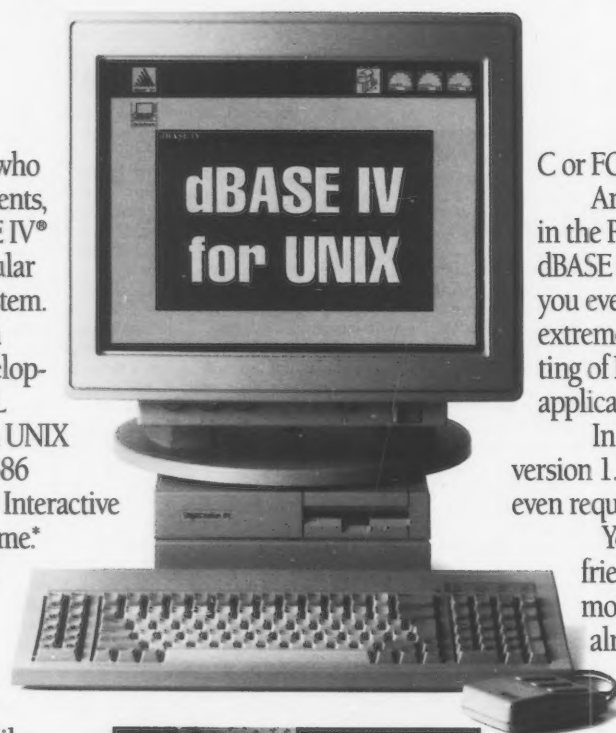
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Complexity lurks for Windows programmers

ANALYSIS

BY JAMES DALY
CW STAFF

There is no denying that slapping on Microsoft Corp.'s 3.0 Windows radically smoothes the process of navigating your way through DOS waters. But if you are hoping to program the next whizbang application for Windows and try to use that same simplistic overlay approach, watch out. Software programmers say that applying old solutions to new problems is asking for trouble.

"Windows 3.0's strengths are also the origin of its weaknesses," said Jef Knutson, consulting editor for software testing at "Software Maintenance News" in Staten Island, N.Y. "Windows is the best thing yet to come along for PC users, but if you employ it improperly, it only winds up creating a new level of fluff and static."

Slow starts

First off, consider a mental shifting of gears. Windows faces the same problem that bedevils anything unique: "It takes a little while to get your bearings straight," confessed Jack Baumann, who helped to create a data entry application as manager of microcomputing at Hughes Aircraft Co. in Long Beach, Calif.

Not everything works with Windows 3.0. Incompatible motherboards, cards and peripherals will be a fact of life. This is a serious concern, Knutson said, because many of these products were produced in such bulk that they will occupy shelf space in large distribution warehouses for a while.

Programmers have also found Windows to be a hungry customer when it comes to memory. "The memory management issues have caused us some grief," said Mary Crist, an engineer at Software Publishing Corp. who worked on its newly released Professional Write Plus word processor for Windows.

Handling memory constraints is a problem that continually pops up among users developing in-house applications as well. "It's a lot of work," said Charles Reamy, an internal consultant at Pacific First Bank in Seattle. "It's a rich environment, but any large-scale project chews up a lot of memory and the response time becomes very slow."

Additionally, the very objects that make Windows so easy to use, on-screen icons, can also be tricky to master. Condensing a string of separate commands into a single icon can be a tough creative process, especially if

the software command is abstract. For instance, what icon would be used to depict a Search/Replace edit function? "I've looked at some icons and can't for the life of me tell what's going on," Knutson said. When checking an application, it is important to make sure an icon is easy to interpret — an imposing icon can be as intimidating as any DOS command sequence.

Once the program is complete, it is time to fix the bugs. Do not breathe easy yet. Knutson said there is currently no clear-cut, cost-effective way of debugging malfunctions arising from Windows 3.0 applications faults or Windows 3.0 real-time management of memory. However, various Windows-based testing tools have been promised for this year.

Technical torture can also be lessened in the long run by using one of the most sophisticated instruments of all: the human voice. "Get on the phone and start making friends with other software developers, testers, supporters — the more the better," said Doug Benson, assistant product manager of the word processing division at Lotus Development Corp.

Mix and match

Benson suggested arranging product swaps in which you place your software into the test department of 15 or 20 other companies also doing Windows 3.0 development. Because they are also in the testing business, they know a bug when they see one.

This strategy also helps out with compatibility testing. The graphics cards, memory boards, scanners and pointing devices used in other software testing departments can help make sure your software is compatible with as wide a variety of other products as possible. Consider sharing with hardware vendors for that added cushion of assurance.

Developers also warn that of the many variables that affect software testing, one of the most significant is the operating environment. The object-oriented, multitasking design of Windows 3.0 can significantly restrict developer control over the code environment in which their software will run. New system files and device drivers will crowd the landscape. While most of these will be well-written programs, Benson warned that nobody is perfect. "There will be bugs in every program," he said.

The road to Windows programming may not be easy, but most developers said that if you are properly armed, you have a much better chance of surviving once the shooting starts.

Oxygen brings DOS up for air

BY PATRICIA KEEFE
CW STAFF

NATICK, Mass. — Microsoft Corp.'s Windows Software Developer's Kit comes bundled with some sample programs. However, developers said that when they try to compile those programs while they have Windows running, they quickly find they cannot because they have run out of memory. Others are forced to cope with time lost because of rebooting and/or moving Windows off of and onto the system.

One developer who ran up against that barrier did something about it, and the result is a little breathing room under DOS.

Rational Systems, Inc. last week introduced Oxygen, a \$199 utility that binds its DOS extender technology to Microsoft's C compilers and linker Versions 5.1 and 6.0. This reportedly allows programmers to compile and link large applications from within Windows, their editor or the Programmers Workbench.

Using both Windows and DOS, Microsoft C developers

are hitting the 640K-byte DOS memory barrier, said Anthony Goschalk, Rational Systems' vice president of marketing. As a result, they are often forced to remove network drivers, terminate-and-stay-resident programs and other tools from their environments.

Developers may also find themselves working with two computers — a potentially expensive and awkward proposition. "It slows you down by half, maybe more," Goschalk said. "You wind up writing in each environment longer than you normally would because it's a pain to switch [machines]," he added.

Breathing room

With Oxygen installed, the Microsoft compiler and linker take up less than 50K of the first 640K bytes, and the remaining portions of the program run in extended memory, added Terrence Colligan, president and co-founder of Rational Systems. Ordinarily, developers need at least 350K to 400K bytes to compile source code, Goschalk said.

While memory extenders such as Quarterdeck Office Systems' QEMM "push up against"

the 640K-byte barrier, Oxygen jumps over it to provide developers with potentially up to 16M bytes of added memory, Goschalk said. However, he added that the biggest compiles typically require no more than 2M bytes.

In addition, Rational Systems claimed that by adding access to extended memory, Oxygen also reduces time-intensive disk accesses and enables large files to link up in up to half the time.

Goschalk said he expects Microsoft to address this issue in Release 7.0 of its compiler, which is expected to ship either at year's end or in the first quarter of 1992. As such, he sees a limited, albeit strong, market opportunity. There are about 1 million C programmers and approximately 300,000 users of Microsoft's C compiler, he said.

Oxygen conforms to the DOS Protected Mode Interface, Virtual Control Program Interface and Extended Memory Specification interface standards. It operates either stand-alone or with Windows 3.0, QEMM, Qualitas, Inc.'s 386-To-The-Max and numerous other extended and expanded memory managers.

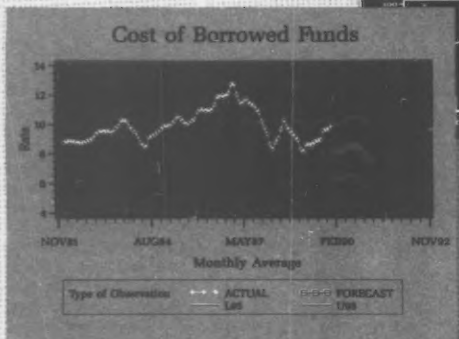
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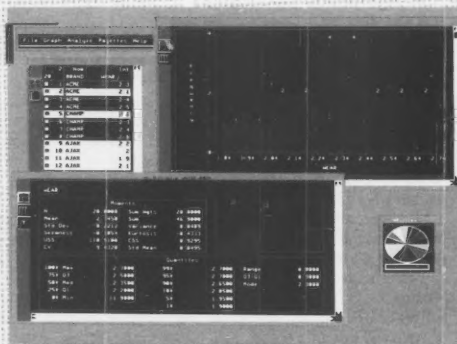
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Restaurant chain cooks up time-saving IS strategy

ON SITE

BY JAMES CONNOLLY
CW STAFF

BOSTON — The premise seems simple. If you have a chain of restaurants captained by a team of carefully chosen managers, you want them making decisions that lead to profits rather than spending their time filling out forms.

That basic idea is behind a personal computer-based systems strategy through which Au Bon Pain — a 100-site chain of cafes and express food stands — is reducing the time managers spend on daily reports and administrative tasks.

The company recently completed a three-month, 50-site rollout of store management and point-of-sale systems. The information gathered by this system may also provide a foundation for the growing 10-year-old chain's first efforts to implement a companywide IS strategy.

"We want to have the managers spending less time calculating and more time analyzing results," said Mark Factor, director of MIS at Au Bon Pain.

When the former Coopers & Lybrand consultant joined Au Bon Pain two years ago, he discovered that store managers had at most only a few hours per week to study their results, plan staffing and production and identify cost problems. "We hired

good managers and then buried them in paperwork," he said.

The heart of Au Bon Pain's business is its cafes, which serve croissants, sandwiches and muffins baked on premises using dough that is prepared and frozen at headquarters.

Until recently, managers at those sites did their planning and cost analysis the way fast-food chains have done for two decades: by taking raw numbers from cash registers and plugging them into paper forms. Even at headquarters, there were only a handful of PCs and an NCR Corp. Tower-based accounting system. In most cases, information moved from one location or department to another on paper.

Factor drew on the IS strategies of other chains, including Mrs. Fields Cookies, in designing the Au Bon Pain system — called Amigo, for Assistant Managers in Getting Out.

Running on Intel Corp. 80386SX-based NCR PCs, the core back office management software was provided by Management Information Support, Inc. in Lakewood, Colo. Those PCs gather sales information from the six to 15 NCR cash registers in each store.

A store PC acts as the manager's system and uploads data to headquarters when polled by a

80386-based PC each day. The host also manages downloading of software, troubleshooting and communications with nine laptop computers used by district managers.

Factor reported that Au Bon

tional database management system and either an Intel I486 or 80386 server.

Amigo lets the manager react to sales by increasing or decreasing staff and food preparation. The latter can be crucial because it takes two hours for raw goods to become finished products. Cooking too many eats up profits. Cooking too few means lost business.

To help achieve a balance, Amigo automates what previously was a rough, manual system. Drawing on information such as sales patterns for previous months and even the day's weather, the system suggests what is likely to be sold throughout the day.

Alan Camuso, manager of one of Au Bon Pain's Boston cafes, has been using the system since it was in beta testing in June 1990. He said the production planning aspects have saved him \$50 to \$60 per day in the cost of leftovers.

In addition to projecting sales, Amigo helps to identify areas of waste by, in effect, assigning dollar values to ingredients and tying those figures to Au Bon

Pain's recipes. This helps a manager to determine, for example, whether a sandwich preparer is regularly applying a few cheese slices too many.

An expert system-based labor scheduler that examines sales figures and suggests staffing levels is now being phased in. Au Bon Pain has eliminated some data entry and saved wage expenses by replacing time cards with automated employee punch-in through Amigo. Not only do employee time records go electronically to a payroll service, but the system prevents an employee from punching in too early. "If you cut even five minutes per shift by eliminating early punch-ins, that can mean \$200,000 on the company's bottom line," Factor said.

The time stamps on the automated system provide a more precise audit trail as managers handle cash throughout the day.

However, Amigo is giving managers the most relief by reducing paperwork. "I was doing eight hours of paperwork every day. That's now four hours, and I can do other things," Camuso said. "Now, when I get my weekend numbers, I can sit down and look at them. In the past, by the time you were done with the paperwork, all you wanted to do was go home."



Linda Block

Pain has selected an architecture for a headquarters system that will be put in place during the course of a year. That system, drawing information originating at the stores and supporting all management and operational needs, will be based on a rela-

Wang takes on 486 market, presents its first EISA PC

BY SALLY CUSACK
CW STAFF

WASHINGTON, D.C. — Wang Laboratories, Inc. unwrapped its first Intel Corp. I486-based, Extended Industry Standard Architecture (EISA) personal computer at the Federal Office Systems Exposition two weeks ago.

"It looks interesting to us; it's a very powerful machine with a very high-speed bus," said Matthew J. Gillman, president of the United States Society of Wang Users (USSWU). "Most importantly, it can be configured as a high-end server, and it appears to be positioned to support faster LAN-based imaging systems," Gillman said.

The PC, designated the EC 480/33C, is priced from \$8,995 and is scheduled for delivery late this month. It supports as much as 64M bytes of memory on the motherboard and can accommodate an optional 128K-byte direct-mapped secondary cache module.

Jack Karp, vice president of desktop computing strategies at the Meta Group, Inc., a West-

port, Conn.-based market research firm, said the announcement is "a good step for Wang, and the product is priced competitively for the IBM and Compaq Computer Corp. market. However, I'm not so sure that is really Wang's competition in this arena." However, he added, "They are not a first-tier vendor and not a second-tier player [in the PC market]."

Karp speculated Wang may expect some competition in price points from companies such as AST Research, Inc.

Status questioned

In related news, user sources questioned the status of Wang's Upword, a Microsoft Corp. Windows 3.0-based word processing program that Wang began demonstrating last year.

Users said the product may not be generally available until the fall, while the company adds what-you-see-is-what-you-get editor capabilities.

However, Wang officials said they will be meeting this week to decide when Upword will be rolled out.

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(If you're thinking
Sun, think again.)

Compaq offers speed for near 386 price

Technology Analysis — A roundup of expert opinions on new products. Summaries written by free-lance writer Suzanne Weisel.

For anyone who thinks a 386SX-based system is just a poor man's 386, Compaq Computer Corp. offers the Deskpro 386S/20. According to reviewers, this product not only rivals some 386-based systems in terms of performance, but it also comes close in terms of price.

Performance: Compaq makes sure you get what you pay for, reviewers said. The 386S/20 is fast. Random-access memory can be expanded from a standard 2M bytes to 16M bytes by adding standard single LU line memory module chips to the motherboard. The 386S/20 also comes with 4K bytes of cache RAM that reportedly responds to 93% of all processor requests with no wait states.

Design: Compaq's construction is sturdy and clean. The motherboard has only one bank of switches and no jumpers, and disk drives are easily removed for maintenance and setup. On the downside, the standard Deskpro case has no reset or speed buttons.

Expandability: With three half-height 5¼-in. drive bays opening from the front of the case plus space for two 3½-in. hard drives, the 386S/20 offers good expansion possibilities. It has four open 16-bit expansion slots.

Support: Compaq has direct telephone technical support for users with common operating systems. It also has a toll-free product information line.

Value: The 386S/20 is well-made, fast and expensive. For 2M bytes of RAM, a 60M-byte hard disk, DOS and a color IBM Video Graphics Array display, you will pay \$5,318.

Reviews Summary

Criteria	Infoworld	PC World	PC Magazine
	2/25/91	2/91	11/27/90
Performance	Excellent	Very fast	Can match 386 machines
Design	Very good	Well-designed	Designed for performance
Expandability	Good	Good	Good
Documentation	Good	NC	NC
Support	Good	NC	NC
Value	Good	Expensive but worth it	You get more for your money
Reviewer's score	7.7	Best buy	Top of the list

Published review score represents Infoworld rating only. NC: No comment. These are excerpts. Refer to actual reviews for details.

Compaq Deskpro 386S/20

Score:
79

Points (maximum)	Category
23 (30)	Published reviews
19 (20)	Analysts' ratings
12 (15)	Users' ratings
13 (20)	Cost evaluation
12 (15)	Vendor financials

(Maximum score: 100)

Compaq responds

Comments from Hedy Baker, Compaq spokeswoman:

Value: Comparing the price of a 386S/20 with a mail-order system is not fair. The street price is competitive, and our products are the highest quality.

Support: We can't guarantee that third-party products we haven't tested will work correctly.

Design: Our customers have indicated no problems with the lack of a reset button.

RATINGS

- Users: Jim Schmeltzer, Groner Boyle & Quillan (overall performance: 8, cost: 5); Charline Avey, Indianapolis Water Co. (8, 9) "Performance is excellent, but the price is not where it should be," Schmeltzer said.
- Analysts: George Thompson, Datapro Research Corp. (8.5, 5); Jerry Caron, Faulkner Microcomputer Reports (10, 6) "Because of video integration and drive options, they're the fastest in SX systems," Caron said.
- Financials: Eric Zimits, Rauscher Pierce Refsnes (overall rating: 9); Jerry Fleming, Fahnstock & Co. (9); Jim Poyner, William K. Woodruff & Co. (6)

NCR: Good performance, limited growth

NCR PC386SX20

Score:
75

Points (maximum)	Category
22 (30)	Published reviews
13 (20)	Analysts' ratings
14 (15)	Users' ratings
13 (20)	Cost evaluation
13 (15)	Vendor financials

(Maximum score: 100)

Reviews Summary

Criteria	Infoworld	PC World	PC Magazine
	2/25/91	2/91	11/27/90
Performance	Very good	Fast	Fast
Design	Good	Solid	NC
Expandability	Satisfactory	Limited space	Costly
Documentation	Very good	NC	NC
Support	Good	Good	Good
Value	Good	Best price/performance	Competitive edge in pricing
Reviewer's score	7.2	Best buy	One of NCR's best PCs to date

Published review score represents Infoworld rating only. NC: No comment. These are excerpts. Refer to actual reviews for details.

RATINGS

- Users: Alan Herman, Jacobson Stores, Inc. (overall performance: 10, cost: 8); Ray Nixon, Thiele Kaolin Co. (8, —) "We have six of them; one is on my desk. They work as advertised, and we are very pleased," Herman said.
- Analysts: George Thompson, Datapro Research Corp. (7, 6); Jerry Caron, Faulkner Microcomputer Reports (6, 5)
- Financials: William O'Connor Jr., Fourteen Research (overall rating: 9); William Baker, McDonald & Co. Securities, Inc. (8)

NCR responds

Comments from Bruce Langos, director of product line management:

Design: Keyboards are a subjective feature. Although this one does not give you an "IBM keyclick," it does provide tactical feedback.

Expandability: 3½-in. drives are currently available with up to 340M bytes capacity. It's hard to imagine an SX needing more than that.

NCR's PC386SX20 offers above-average performance at an above-average price. Extras such as built-in Super VGA more than balance out drawbacks such as limited expandability, making the product worthy of serious consideration, according to reviewers.

Performance: Reviewers agreed the PC386SX20 is fast. It comes with 2M bytes of random-access memory expandable to 8M bytes on the motherboard. Performance is boosted by a 16K-byte RAM cache. Reviewers also liked the quality and speed of the Super VGA video subsystem.

Design: NCR keeps things simple inside and out. Inside the small footprint case, the video, disk, parallel and serial functions are all on the motherboard, leaving four 16-bit slots open. Except for the keyboard, which *PC World* says is too quiet and soft, the system is well-built.

Expandability: Reviewers and users agreed the PC386SX20 falls short in expandability. With only three 3½-in. drive bays, there is not much room to grow. There is, however, a built-in external floppy port. Memory can be expanded beyond 8M bytes via NCR's currently available memory boards.

Support: NCR supplies direct buyers with technical support including a one-year on-site warranty. If the system is purchased through a dealer, the user may rely on dealer service or buy NCR support.

Value: The basic PC386SX20 costs about \$3,445. The price goes up fast, however. Add a 100M byte hard disk and you are up to \$5,195, and 2M byte memory upgrades cost about \$750 each. Still, unless you need four or more drive bays, reviewers said this system will earn its keep.

Methodology: Published reviews: average of numeric scores from product reviews published by personal computer publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied

by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of financial analysts' ratings of vendor financials and ability to support product multiplied by 1.5.

COMMENTARY

Christopher
Lindquist

Applications made easier



I must confess, when I was first given a prerelease copy of Borland's Objectvision application development system for Microsoft's Windows 3.0, I was a bit disturbed. There was only one high-density disk and a pair of relatively thin — by Borland standards — manuals. Exactly how comprehensive an application development environment could fit in that amount of space? A lot — as I soon found out.

Borland claims that any experienced personal computer user will quickly be able to create applications with Objectvision. I'm not sure that is the case; developing decision trees for complex processes may be more of a task than some users will want to approach. However, any IS programmer or user familiar with creating spreadsheet templates or database applications will be able to quickly and easily create Windows-compatible forms-based applications for a wide variety of uses.

I spent a couple of hours working my way through the tutorial. Forms creation with Objectvision is a snap; it could even be described as enjoyable. About the only time a user ever has to touch the keyboard is when he first types in field names. After that, lists of commands, field types and fields are a mouse click or two away.

Multiple forms can be linked together in any application, allowing businesses that use multipart or multiple forms for a procedure to duplicate the process on the screen.

Forms can include all the standard alphanumeric, date, time and currency fields found in most databases. Multiple fonts, clip art and shaded boxes can be added to enhance the visual appearance of a form or to make it an exact replica of a paper version. Check-off boxes that pop up to prompt the user for input can also be created, as can buttons to control such necessities as clearing the screen and saving data.

Once the form is finished, a "decision tree" has to be created for the application. A decision tree is a graphical representation of the IF-THEN-ELSE loops so familiar to programmers. At this point, the developer decides how the application is going to manipulate any data that is input by the user, such as

totaling sales figures or calculating discounts.

For the decision tree stage, I definitely recommend taking Borland's advice and sitting down and thinking through the decision process before simply jumping into tree creation. The trees can get complex quickly, and while Objectvision lets the developer zoom in and out to get an overview of the tree, it would be easy to get lost in a jungle of branches without some previous planning.

After the tree is created, the form can be tested without linking it to a database. This allows the developer to debug the application without going through the process of making database links only to find out that the data manipulation is faulty. My only real complaint with the program came at this point. It would be beneficial to have

MULTIPLE FORMS CAN be linked together in any application, allowing businesses that use multipart or multiple forms for a procedure to duplicate the process on the screen.

some sort of integrated debugging in Objectvision.

For example, with a simple tree, it is quite easy to find errors, but finding small errors in complex applications could be a tedious hit-and-miss process. Being able to step through each branch of a decision process while watching both the form and the tree would help isolate errors and be a great help in testing the applications.

Once the form and decision tree are complete, the developer can make links to whatever database he plans on using. Objectvision supports links with Borland's Paradox, Ashton-Tate's Dbase III, Novell's Btrieve, ASCII and read-only links with Windows' Dynamic Data Exchange. Creating links with Paradox is a breeze. Objectvision lets the developer simply type in link and table names. The Paradox table is automatically created without developer intervention.

The whole application development process is very — to use an overused term — intuitive. Forms can be created quickly and require no programming ability. Information systems developers could easily train any end users to create forms to suit their needs. More advanced users may find that application development actually can be fun.

Lindquist is a *Computerworld* copy editor.

Desktop

FROM PAGE 37

data storage consulting company in Santa Barbara, Calif., said they think that will continue.

"There is a need [for higher-capacity hard drives on portables]. The need is driven by new applications that are memory-intensive, such as imaging, graphics, even voice," Abraham said. "So we have these same new application areas being utilized even in the laptops and notebooks."

Obvious needs

The need is clear at Coors Brewing Co. in Golden, Colo. Coors last year outfitted its sales force with Compaq LTE 286 machines, which have 40M-byte hard drives, and has found that some of its users have outgrown the drives. Coors will give 10 of its 35 area managers Compaq SLTs with 100M-byte hard drives so these power users can run more programs.

Coors also purchased a couple of the new LTE 386S/20s with 60M-byte drives, according to Donna Whitley, laptop project manager, who said the rest of the managers needed the extra capacity on the SLTs.

Another user who wants

more capacity before moving to lighter weight SX notebooks is Dick Nelson, vice president of systems at New York Life Insurance Co. Nelson has repeatedly said he would move his 10,000 agents to SX notebooks as soon as the machines get hard drives with 100M bytes of capacity.

Nelson and other information systems managers whose users

THE TREND toward larger drives has been accelerating.

need high-capacity portables could find this year a happy one. Areal Technology, Inc. said it will have 2½-in., 120M-byte drives by May, and Maxtor Corp. has announced plans for such a drive. IBM is also reputed to be working on 120M-byte drives in a 2½-in. form factor.

Abraham said the larger hard drives will be timely for the market. "Programs are large, but more importantly, the data set is larger," he said. "The classic example is imaging. You can consume up to 20M bytes of disk space with one application if it has several images."

NEW PRODUCTS

Board-level devices

Microway, Inc. has announced Fastcache-SX/Plus, an IBM Personal Computer AT expansion card designed to convert an AT or compatible into an Intel Corp. 80386SX-based system equipped with up to 8M bytes of extended memory.

The product includes an optional Intel 80387SX processor that reportedly enables the board to yield up to 1.7 Megawhetstones. It can also be used to backfill a 512K-byte motherboard to 640K bytes, according to the vendor.

The card also allows AT users to run multiple tasks under operating environments such as Microsoft Corp.'s Windows 3.0.

A 16-MHz version costs \$595, and a 20-MHz model is \$695.

An installation/cable kit for AT compatibles is priced at \$95, and an interconnect board for the 6-MHz AT is \$50.

Microway
P.O. Box 79
Kingston, Mass. 02364
(508) 746-7341

Continued on page 46

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NEW PRODUCTS

Software applications
packages

Frame Technology Corp. has announced the latest version of its workstation publishing software package.

Framemaker Version 3.0 includes intelligent tables that can be used to integrate statistical data, price lists, schedules and spreadsheet and database information in an easily readable format. Conditional text capabilities allow users to create multiple variations of documents from one base document.

Framemaker Version 3.0 costs \$995 for a fixed license for Apple Computer, Inc. Macintosh systems or Next, Inc. Next computers. A floating license for Unix-based workstations is priced at \$2,500.

Versions for Macintosh and Sun Microsystems, Inc. Sun-3 and Sun-4, and Intel Corp. 80386-based workstations running under Sun View are scheduled to begin shipping in the second quarter. A package for the Open Software Foundation Motif-based workstations and versions for Next systems are slated for a third-quarter release.

Frame Technology
1010 Rincon Circle
San Jose, Calif. 95131
(408) 433-3311

Version 2.5 of Atex, Inc.'s Atex PC Page Makeup software package was designed to operate on IBM Personal System/2s.

The product can run under Microsoft Corp.'s Windows 3.0 environment. Features include spot-color capability, rotation of elements, free text scaling and cropping and scaling of graphics.

The software package is priced at \$1,995 and has been shipping since mid-February.

Atex
165 Lexington Road
Billerica, Mass. 01821
(508) 670-3000

KD Systems, Inc. has begun shipping Organon, a personal computer program designed to automatically generate typeset-quality organizational charts from a database.

The product operates with any database that can prepare a text file of employee data. It reportedly can read the text file and generate a chart in seconds.

Organon is priced at \$495.

KD Systems
P.O. Box 97024
Raleigh, N.C. 27624
(919) 847-8838

Software utilities

Atech Software, Inc. has introduced a universal typeface converter that enables users to convert typefaces from nearly any format to another.

Alltype supports outline typeface formats such as Adobe Systems, Inc.'s Postscript Type I and Postscript Type III and Bitstream, Inc.'s Fontware and Speedo. The product is scheduled to begin shipping next month and costs \$80.

Atech Software
5964 La Place Court
Carlsbad, Calif. 92008
(619) 438-6883

Funk Software, Inc. has begun shipping a version of its Sideways printing utility that features support for Lotus Development Corp.'s 1-2-3 spreadsheet Releases 3 and 3.1.

Version 3.3 of Sideways was designed to rotate text 90 degrees as it prints, thereby enabling wide spreadsheets to be printed on narrow-carriage dot matrix printers, the vendor said. Users of Lotus 1-2-3 Release 3 or 3.1 can load Sideways as an add-in application.

Sideways 3.3 is priced at \$90.

Funk Software
222 Third St.
Cambridge, Mass. 02142
(617) 497-6339

Data storage

Microtech International, Inc. has begun shipping its Eclipse series of internal and external drives designed for Next, Inc. Next computer platforms.

The series includes the Eclipse 50R, which is equipped with 50M-byte removable cartridges; the Eclipse CD, a compact disc, read-only memory drive that features a 350-msec access time; and 1M- and 4M-byte memory upgrade kits for system memory expansion. The series also includes external drives that feature storage capacities ranging from 200M bytes to 1G byte, according to the vendor.

Pricing ranges from \$1,099 to \$5,399, depending on type of drive purchased.

Microtech International
158 Commerce St.
East Haven, Conn. 06512
(203) 468-6223

Peripherals

Rasterops Corp.'s Colorboard 1024MC is a 24-bit, 1,024- by 768-pixel display adapter designed for IBM Personal System/2s and Micro Channel Architecture-based compatible machines.

The adapter (\$3,995) is said to allow users to simultaneously access up to 16.8 million colors.

Rasterops
2500 Walsh Ave.
Santa Clara, Calif. 95051
(408) 562-4200

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Prisym, Inc., 146 Mannetto Hill Rd, Huntington, NY 11743-6606 (516)-367-6776

Bitstream, Inc. has announced an open-ended, expandable font cartridge designed for Hewlett-Packard Co.'s Laserjet Series II printers.

Type City (\$379) enables users to add typefaces, logos or symbols to business documents. It includes a supercartridge equipped with text and headline typefaces.

Screen fonts for Microsoft Corp.'s Windows and a guidebook are bundled with the system, and Deli, an add-on card equipped with typefaces and symbols, is included free with a basic package. Type City started shipping last month.

Bitstream
215 First St.
Cambridge, Mass. 02142
(617) 497-6222

Systems

Commodore Business Machines, Inc. recently cut the suggested retail price of its Amiga 2000 and Amiga 3000 personal computers between 6% and 26%.

The company pared the prices of several peripherals between 10% and 54%. Commodore also said it had launched a service program called Commodore Express Gold Service. The service gives customers a 24-hour toll-free help line and next day on-site service at no charge for one year from the date of purchasing Commodore's consumer products.

Commodore Business Machines
1200 Wilson Drive
West Chester, Pa. 19380
(215) 431-9100

RDI Computer Corp. began shipping its 13-pound Britelite portable based on Sun Microsystems, Inc.'s Scalable Processor Architecture chip. RDI claims that the Britelite, which retails for \$10,800, is the only computer on the market compatible with Sun's Sun OS flavor of Unix, Microsoft Corp.'s DOS and Apple Computer, Inc.'s Macintosh. The machine offers an optional 1,152- by 900-pixel resolution screen but also comes standard with 640- by 480-pixel resolution.

RDI Computer
Building A
6696 Mesa Ridge Road
San Diego, Calif. 92121
(619) 558-6985

NETWORKING

COMMENTARY

Elisabeth Horwitt

Victim of success?



Sometimes too much success can backfire.

Right now, IBM is struggling to overcome the inertia represented by a huge installed base at Fortune 500 companies that, during the past decade or so, bought IBM's systems strategy of hosts and dumb terminals and then hosts and IBM Personal Computers.

That strategy made IBM king of the computer market for years. Now, it is making it very difficult for IBM to migrate its users to a distributed, peer-to-peer networking strategy that is slowly but surely becoming the next phase of business computing.

Since last year, IBM has been going all out to revamp its Systems Network Architecture (SNA) platform to support peer-to-peer computing. This month's announcement of Advanced Peer-to-Peer Networking for OS/2 is IBM's bid to bring peer-to-peer SNA onto the local-area network. And the vendor has made significant progress toward enabling its SNA backbone products, such as the 3745 front end, to support peer-to-peer networking.

IBM has also been aggressively enhancing Netview to manage distributed peer-to-peer networks. Earlier this

Continued on page 52

IBM expands European telecom line

BY JOANIE M. WEXLER
CW STAFF

LONDON — Building on its strategy to interface its proprietary Systems Network Architecture (SNA) environment to the "open" world of standards, IBM recently extended support of its Callpath Services Architecture to telephone switches based on European standards. Initial European switch support will include the Siemens Stromberg-Carlson Hicom 300 and IBM Com300.

IBM has also added Callpath capability to its 370- and 390-class mainframes in Europe and said it will begin selling its Inte-



grated Services Digital Network (ISDN) adapter cards overseas.

IBM's Callpath software links computer databases and telephone systems, allowing users to

display caller data on their screens as calls come in. Callpath support for the Application System/400 midrange computer, announced last May, is slated to ship "later this month," according to IBM.

"Since Callpath is aimed at business applications requiring coordinated voice and data, it's important that IBM has made it available for its big machines," said H. Paris Burstyn, vice president of telecommunications at Business Research Group, a consultancy in Newton, Mass. "This

is because companies store most of their records on computers of that size."

In January, the company announced ISDN basic-rate adapter cards for the Micro Channel Architecture models of its Personal System/2 and its 3174 Establishment Controller. IBM said it intends to offer a basic-rate ISDN card for the AS/400 both in the U.S. and Europe within two years.

Basic-rate ISDN offers 144K bit/sec. of switched bandwidth channelized in two 64K bit/sec. circuits and one 16K bit/sec. circuit. Burstyn said an adapter to the 1.5M bit/sec. primary-rate ISDN network would be more appropriate for the powerful 3174 and AS/400.

However, "even though basic-rate ISDN seems slow, it is still far faster than most lines connecting terminals or PCs to hosts today," he said.

Burstyn said his firm recently conducted an interconnectivity survey, and "far and away the most common speed was 19.2K bit/sec. over analog voice-grade lines" using modems.

Burstyn conceded, however, that basic-rate ISDN adapters have limited appeal today in the U.S. because of the lack of ISDN service offerings from the local telephone companies.

The research firm estimates that the nearly half-million basic-rate lines deployed by the RBOCs in 1990 represented just .5% of the 106 million RBOC access lines in use. Burstyn said he expects the number of RBOC Basic Rate ISDN lines to double in 1991.

ISDN aims to give users ubiquitous dial-up digital voice, data, image and video services between desktops in the same manner users get telephone and facsimile service today.

FEATURE: ELECTRONIC MAIL

Setting ground rules for privacy

BY CHRISTINE CASATELLI
SPECIAL TO CW

With its potential for instantaneous communications, electronic mail has changed the way America works and opened up a whole new arena for employer/employee conflict in the process. Some companies have already been taken to court over E-mail privacy issues, and experts say more cases may soon crowd the dockets if employers continue to ignore the need for written policy statements on E-mail use and administration.

Without established policies in place, employers and employees can find themselves at odds over different interpretations of E-mail privileges. "At the very least, [the lack of a clear policy] will cause ill will at a company," says Walter Ulrich, an E-mail specialist at Arthur D. Little, Inc. in Los Angeles. "At most, it can result in a lawsuit."

Increasing use is making the issue more pressing: Today, more than 12 million employees in the U.S. routinely send messages back and forth electronically, according to Michael Ca-

vanagh, executive director of the Electronic Mail Association in Arlington, Va. However, only a small number of companies are taking steps to

Continued on page 50



Heidi Younger

Satellites help trucking firm keep tabs on fleet

BY ELLIS BOOKER
CW STAFF

FORT WAYNE, Ind. — Can you misplace a 16-ton truck? No, but you can lose track of it for a few hours, and that — at the very least — can mean anxious customers every day.

For North American Van Lines, Inc., the fifth largest trucking company in the U.S., the routine of waiting for its drivers to call in and report their positions made it impossible to pinpoint a truck's location in answer to a customer inquiry. What was

more, a half-full truck might have rolled past a pickup spot, never knowing until later there was a customer a few miles away.

A new satellite system, currently installed on 200 trucks and planned for the entire North American fleet of 3,700 trucks by sometime next year, provides location information on each vehicle to an accuracy of within 1,000 feet.

"There wasn't a predetermined policy about drivers calling in from the road," said Mike Gunkel, vice president of corpo-

rate marketing.

After two years of study, North American issued a request for proposals last year. In January, North American signed a \$12 million contract with Qualcomm, Inc. to supply its Omnitrac two-way communication system.

Currently, about 10 to 15 personal computers here track the trucks. It takes about three minutes between the time an operator requests the position of a vehicle for a map to be displayed showing the truck's direction and distance from the nearest town. The Qualcomm system contains maps of 10,000 cities.

However, North American said it will abandon the map display because the directional and distance data — calculated on the trucking firm's Amdahl Corp. mainframe — is the more valuable source of information.

There are currently Omnitrac systems deployed across the continental U.S., according to a spokesman at San Diego-based Qualcomm.



Satellite path

In addition to the telemetry feature, the Qualcomm satellite system provides a communications path between the home office and the mobile unit. In North Ameri-

can's case, each truck cab is equipped with a keyboard and an LED display.

The display, using alphanumeric codes, can send various requests for information such as the status of pickups, drop-offs and available hours.

If providing up-to-the-minute information to customers was the driving force behind the satellite system, will North American be providing its customers with on-line access?

Absolutely, according to Gunkel, who said this has always been the plan. He added that some North American customers already have on-line access to the company's traditional databases. He said customer access to the satellite tracking system would probably be offered sometime next year.

Their Open Systems promise



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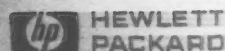
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Rules have limits

Entertainment giant Warner Bros., Inc. expects to add an amendment on electronic messaging to its corporate computer guidelines by year's end. A draft version is now circulating for approval.

One thing that is already certain, says Bill Cotter, vice president of international information systems, is that "all data that flows through the computer is considered to be confidential, and for no reason will it be divulged to a third party." Cotter says a criminal investigation is about the only way someone other than the sender or the recipient would be made privy to E-mail messages.

The Warner Bros. policy will also state the terms for E-mail use, Cotter says. "We're clarifying that electronic mail is to be used only for company business," he adds. The provision may be difficult to enforce because there are no plans to monitor messages that go over the network; if someone were to be detected using the E-mail for personal matters, however, Cotter says it would be passed along to the human resources department.

But even written policy cannot prevent every problem. Warner Bros. integrates E-mail systems from Hewlett-Packard Co., Wang Laboratories, Inc., Digital Equipment Corp., IBM and others into a single network, which poses a unique set of problems for users of incompatible systems who want to encode their messages.

"We offer the highest level of encryption within each user's system," Cotter says.

CHRISTINE CASATELLI

Privacy

FROM PAGE 47

set down any policy on E-mail use, leaving most of those users in the dark as to where they stand.

One major point of contention is the technology's potential for workplace monitoring, Cavanaugh says. "This is a new aspect of how we look at workplace policies," he says. The spotlight cast on E-mail may stir up an even larger debate over how technology is used to manage employees, he says.

The electronic messaging dilemma came to a head last August when a class-action suit was filed in Los Angeles against Eppson America, Inc., which fired an E-mail system administrator who alleged that the company's interception of E-mail messages violated the privacy of employees. The case was dismissed in January on the grounds that E-mail does not fall within the state's wiretapping law; that decision has been appealed.

Similar case

In January, Nissan Motor Corp. became the subject of a similar suit when two former employees charged that their E-mail messages, which they believed to be confidential, were seized and used against them. That case is also pending.

Jerry Berman, director of the Information Technology Project for the American Civil Liberties Union, says it will take more than a few lawsuits to sort out the complex privacy and property issues surrounding E-mail. "They're going to be decided partly by the courts, partly by the Congress and partly by the institutions developing a culture around these technologies," he says.

There is currently no federal law that addresses the rights of E-mail users and owners, but congressional sources say it is likely that the Electronics Communications Privacy Act will be revised this year to include electronic messaging technology. A Senate subcommittee on technology and the law has appointed

a task force to investigate issues surrounding corporate E-mail and other high-tech devices such as Caller ID. The task force is expected to give its recommendations to the subcommittee chairman, Sen. Patrick Leahy (D-Vt.), next month.

In the meantime, employers can help prevent legal bouts by

management is looking at E-mail communications is to make sure the ground rules are explicitly clear," Plesser says. If a company's goal is to monitor electronic messages as needed, then it is critical that employees are notified of that intention from the start, he says.

Just adding a page to the cor-

Some companies take the view that employees who are concerned about their privacy should assume that E-mail messages generated from company computers and stored on company hard disks are company property, says Jerry Sands, senior security consultant at Advanced Information Management, Inc. in Woodbridge, Va.

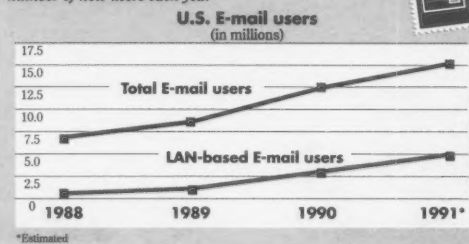
This is a reasonable viewpoint, Sands says, given that workers who use E-mail to send frivolous messages or to run their own businesses are eating up company resources and processing power. "E-mail systems are hogs, and I don't think many people are cognizant of that fact," he says.

If a policy exists, then management should do its best to enforce that policy lest it lose credibility, Sands says.

On the privacy side, follow-through is equally important to prevent litigation. "You've got to make sure the policy is enforced," Plesser says. Whatever its view, management should be paying more attention to E-mail issues, says Arthur D. Little's Ulrich. "Now that there have been suits, people are aware of the problem and should be developing policies," he says. "If you don't develop a policy over the next 12 months, then you are not being diligent."

Mail call

Electronic mail's popularity is well-illustrated by the number of new users each year



Source: International Resource Development, Inc.

CW Chart: Paul Mock

taking the time to develop straightforward policies that outline company rules and responsibilities for E-mail users, says Ron Plesser, former general counsel of the U.S. Privacy Protection Study Commission and partner at Piper & Marbury, a law firm in Washington, D.C.

"The most important thing in any kind of internal policy where

porate computer manual or human resources handbook is not enough, Plesser says. Companies should also consider adding policy messages to screen menus, placing stickers on equipment or even requiring employees to sign affidavits noting that they understand the rights and responsibilities of using corporate E-mail systems, he says.

Written or simply understood?

Not having a written policy on E-mail does not necessarily mean a firm has no position on the issue or has simply ignored it. At Hallmark Cards Co. in Kansas City, Mo., the E-mail network serves roughly 4,500 subscribers. John Collins, vice president of IS, says user privacy is the top priority for the greeting card maker's E-mail system. "Our view is that people corresponding on E-mail have the right to privacy like in any other type of correspondence," he says.

Although Hallmark's policy is not written down, Collins says it has never been questioned by workers or managers.

"We've never argued it on moral grounds. We just think it's a good company practice."

Hughes Aircraft Co. in Long Beach, Calif., has never formulated an official policy, but, according to Steve York, manager of the informa-

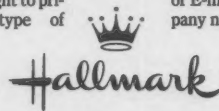
tion exchange technologies group, the firm has explored E-mail issues several times. Now, York says, Hughes is the closest it has ever been to writing down a corporate directive. "Our technical people have talked with our legal people and our human resources people to see if we should develop a policy," he says.

Traffic volume is one motivating factor.

Hughes employees send tens of thousands of E-mail messages each day over a company network linking 30,000 users. Most of the communications are internal notes and memos, but suppliers and other aerospace firms are also part of the E-mail hookup. Another source of motivation has been the two recent lawsuits relating to E-mail, both filed in Hughes' home state.

York says those cases spurred company executives to focus more attention on the problem.

CHRISTINE CASATELLI



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NEW DEALS

NASA to award contract for Planet Earth

The National Aeronautics and Space Administration is expected to award a contract by year's end to build an Earth Observing System Data and Information System Core System as part of its Mission to Planet Earth program to collect and disseminate information on global environmental problems.

The system will process, store and distribute data collect-

ed by U.S. Earth Observing System platforms, which will be working with European and Japanese space platforms to provide environmental data to scientists worldwide. A team led by TRW, Inc.'s Systems Integration Group will bid on the 10-year contract, the company said.

The Pittsburgh Supercomputing Center has implement-

ed what it claims is the first direct high-speed data transfer between a Connection Machine System from Thinking Machines Corp. and a Cray Research, Inc. Y-MP supercomputer. The link was made in collaboration with both vendors as part of a program to implement applications across heterogeneous supercomputers, the center said.

Acquisitions bring promise of E-mail integration

ANALYSIS

BY JIM NASH
CW STAFF

Electronic mail becomes less of a peripheral software gadget with every acquisition and marketing agreement between personal computer software companies and E-mail vendors.

Networking and distributed processing vendors, by and large, have been accused of taking a cavalier attitude toward lowly E-mail. "You can say that again," said John Ryan, a member of the Networking Applications Consortium. "They typically don't have the expertise to come up with a first-class E-mail program."

Network managers have grown frustrated with nonstandard and disparate E-mail packages. Users are taking heart now, as they watch the software giants cry "uncle" and look to E-mail pioneers themselves for a development boost.

Among the benefits expected from collaboration are new applications for E-mail and tighter integration of E-mail with the products of software industry leaders.

NETWORK MANAGERS have grown frustrated with non-standard and disparate E-mail packages.

Most recently, Microsoft Corp. announced an agreement to buy Consumers Software, Inc., a Vancouver, B.C., company that makes Network Courier E-mail software and several gateways. The move gives Microsoft its first PC E-mail package. It already sells Microsoft Mail 3.0 for Apple Computer, Inc.'s Appletalk network.

Disagreement ends

In February, Novell, Inc. ended years of bickering with Action Technologies, Inc. over its jointly developed Message Handling Service E-mail engine. Users said they hope the peace treaty will free resources for new Action products.

Novell already owns a stake in E-mail firm Da Vinci Systems Corp. Also last month, Lotus Development Corp. bought CC:Mail, Inc., Consumers' chief E-mail competitor.

To Ryan, director of systems engineering at Compaq Computer Corp.'s communications technology department in Dallas, all of this sounds pretty much on target. The applications consortium, he said, comprises Banyan

Systems, Inc. users who are "tired of the batteries-not-included attitude" exhibited by network vendors who market platforms without key integrated services.

"The giants in the [networking] industry are finally recognizing that E-mail is essential," said

Larry Quinlan, manager of local-area network services at DeLoitte and Touche in Nashville.

That recognition could mean a dramatic rise in the number of E-mail users, said Winston Leong, a communications consultant at Avon Products, Inc. in Pasadena, Calif. E-mail, Leong

said, should be as common and integrated in networks as dictionary services are in word processing applications. "E-mail will only be a medium in delivering messages then," he said.

Quinlan said he hopes to see electronic routing of forms become a reality. He would like to

see standard purchase orders and personnel forms become part of E-mail packages, not unlike an electronic data interchange system for internal use, he said.

Quinlan also said greater involvement by large software developers could also result in bulletin-board services set up exclusively for individual companies.

How can you know which lease proposal is best?



A lease agreement is a contract that gives a lessee the right to use an asset without owning it. It's a financing arrangement that can be used for a variety of purposes.

Leasing is a flexible financing option that can be used for a variety of purposes. It can be used to finance the purchase of new equipment, to replace old equipment, or to finance the purchase of land.

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The best lease proposal is the one that allows you to lease your equipment for the lowest possible cost while providing you with the most flexible terms.

That's exactly what CompuLease, the world's largest, independent lease and financing company, can do for you. CompuLease gives you the ability to lease or finance your equipment during the lease term in your own company. It also gives you the ability to purchase the equipment at the end of the lease term for a nominal fee.

CompuLease is a flexible financing option that can be used for a variety of purposes. It can be used to finance the purchase of new equipment, to replace old equipment, or to finance the purchase of land.

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BIT BLAST

ISDN on-line services added

The first two commercial on-line information services to be available through an Integrated Services Digital Network (ISDN) connection were announced earlier this month by **Mead Data Central, Inc.**, which will offer Lexis and Nexis via **Illinois Bell Telephone Co.**'s Basic Rate Interface ISDN service. Illinois Bell ISDN customers will be able to access the databases at 9.6K bit/sec., conduct research faster and lower their on-line charges, Mead Data Central said.

Nine new electronic mail systems have been brought into the **Softswitch, Inc.** interconnection fold. The vendor has added Open Systems Interconnect X.400 interoperability between its gateways and IBM's Information Network. Intercommunication support between local-area network E-mail packages has also been added for systems from **Da Vinci Systems Corp.**, **CE Software, Inc.** and **Sitka, Inc.** Mainframe- and mini-computer-based E-mail packages now interconnected through the Softswitch gateway include those from **ICL,**

Inc., Computer Associates International, Inc. and **NBS Systems, Inc.**

A Switched Multimegabit Data Service (SMDS) interface for linking LANs over wide-area communications lines will reportedly be bundled into **Cisco Systems, Inc.**'s multiprotocol routers come June. SMDS is a switched high-speed data interconnection service rolling out from the regional Bell operating companies.

A group has formed to quickly provide companies with custom graphical user interfaces for existing character-based and proprietary interfaces now running on Unix, **Digital Equipment Corp.**'s VMS and other workstations. **Sunrise Software International's Rapid GUI Conversion and Integration Group** said it will complete interfaces in 30 to 90 days.

More than 60% of 200 telephone company customers recently surveyed by **Andersen Consulting** said they would like to see competitive alternatives in the local-exchange market.

Horwitt

FROM PAGE 47

month, it announced a Netview Distribution Manager product that will allow companies to centrally store and generate software, operating system images and configurations on the host and then download the code to remote users by way of OS/2 LAN servers. In addition, OS/2 servers running APPN will be able to send LAN alerts up to a Netview host, either directly or via an Application System/400 intermediary.

The problem is that IBM's peer-to-peer strategy is based on two offerings that so far have failed to catch on with users: OS/2 and LU6.2.

Users are not entirely averse to IBM's concept of OS/2 Extended Edition servers, equipped with peer-to-peer SNA protocols, acting as gateways between LAN clients and SNA resources. When APPN software for OS/2 becomes available next fall, OS/2 servers will be able to act as liaisons between OS/2 and DOS clients on the LAN and other resources on the SNA backbone. They will be able to route LAN transmissions—including those generated by popular Netbios and eventual-

ly Novell IPX/SPX applications as well—over SNA links.

What users resist, however, is the idea of an OS/2-based LAN workstation, and that contributes to their resistance to using LU6.2. The peer-to-peer protocol takes up far too much memory on a DOS machine and is also notoriously difficult to write applications for.

Users seem perfectly happy to use Netbios and Novell applications on their LANs and implement a dumb terminal SNA gateway for LAN users to get to hosts. Yes, there are some companies that have found LU6.2 a much more efficient way to interconnect users with host applications. And yes, many users are very interested in the dynamic routing and directory services offered by APPN.

But the majority of firms has no immediate plans to migrate to IBM's peer-to-peer protocols except in a limited fashion. The problem is the huge installed base of 3270 applications that users would have to rewrite, according to David Passmore, a partner at Ernst & Young.

IBM is obviously aware of all of the above problems. The vendor is working on a more streamlined version of LU6.2 for DOS and is considering hitching LU6.2 to Microsoft's Win-

dows, a spokesman tells us.

IBM is also said to have looked at, but shelved, providing LU6.2 transport for 3270 applications, which would enable users to take advantage of all the efficiencies and dynamic routing capabilities of peer-to-peer SNA without having to rewrite their 3270 applications.

There is yet another IBM success story that is getting in the way of the vendor's current efforts to sell peer-to-peer SNA. IBM has managed to convince analysts and users alike that it is really serious about Open Systems Interconnect (OSI) as a way to connect its own systems with those of other vendors. Passmore says. However, IBM has also begun pushing its APPN as the "open" transport mechanism to tie SNA and non-SNA worlds together.

This leaves the vendor's customers with a tough call: Should they base their multi-vendor networking strategies on peer-to-peer SNA strategy or on OSI? IBM has trumpeted its commitment to both strategies and is still far from providing a full-function platform to support either.

Anybody got a coin to flip?

Horwitt is a *Computerworld* senior editor, networking.

Ch



Ch



Have you noticed the way networks attract more and more hardware as they change?

It's a bridge box here. A router box there. A brouter box here.

Costly devils.

Which is why we've built NETBuilder.® It lets you switch from bridging to routing to brouting by changing a single software diskette. The hardware stays the same.

To simplify matters even more, NETBuilder's bridge, router and brouter have the same menu-driven user interface. So there's a common look and feel. Yet, you can still create custom menus to suit a particular network environment.

As a result, NETBuilder cuts three big expense items in internetworking—new hardware purchases, and the training and servicing to support it.

Yet, you sacrifice nothing for this simplicity.

UK telecom duopoly loosening, U.S. gains

BY ELISABETH HORWITT
CW STAFF

LONDON — Great Britain's government made several policy decisions earlier this month that will foster greater competition in the country's long-distance and local communications service markets. The loosening up of the current market duopoly of British Telecom PLC and Mercury Communications Ltd. paves the way to cost savings for U.S. companies that use the UK as a hub for their international networks.

In a prepared statement, Bryan Carsberg, the UK's director general of telecommunications, praised the government's moves toward competition as encouraging greater efficiency as well as promoting "the provision of better quality of service and of variety of services." The decisions were the culmination of a multi-month review process of the UK's telecommunications policies, called the "duopoly review."

Britain has led Europe and, according to some sources, even

the U.S. in its denationalization and deregulation of the telecommunications market, according to Todd Dages, a director at The Yankee Group in Boston.

The recent decisions would expand the current two-carrier system to additional providers that could provision their own switches and resell the primary carriers' bandwidth — presumably at a lower price than is now offered, Dages said. "Now, AT&T can set up its own hub and provision its own services" instead of having to go through British Telecom, he added.

Good news for all

The additional competition will be "good news to users both in the UK and internationally, driving down prices there," Dages said. "This is particularly important in the data market, which is less mature and growing more quickly" than voice services, he added.

In addition, Britain's move is likely to bring about similar deregulation on the part of countries such as Belgium, France

and Germany, which compete with the UK for European hub traffic, Dages said.

United Parcel Services, Inc. (UPS) stands to benefit greatly from more competitive prices in the UK because "we have a private-line network that switches through London to Germany," said Douglas Fields, the package handler's manager of telecommunications for information services.

In addition, UPS is looking at reselling some of the bandwidth on its own dedicated international lines to customers so they can connect with their business partners and users overseas without having to set up their own private-line network, Fields said. "It's an added value to our package handling service," he said.

The government's decision also paves the way toward more competition on the local loop. Several U.S. regional operating companies have been setting up joint ventures with British cable companies in hopes of entering the local networking market in certain regions of the UK [CW, Jan. 7].

Bell operating company spokesmen said their companies' launching of such services depended on whether the review resulted in a more favorable regulatory climate for such services.

Video travels the globe

BY JOANIE M. WEXLER
CW STAFF

TORONTO — Determined to extend videoconferencing beyond the boardroom, Northern Telecom, Inc. recently said it is building a global, dial-up, full-motion video network to link 49,000 employees.

Don Sproule, Northern Telecom's director of network planning, said the firm has been beta-testing Peabody, Mass.-based Pictoretel Corp.'s System 4000 since December and has contracted to purchase up to \$2.5 million worth of the equipment.

Previously, the firm had been using another manufacturer's gear in six videoconferencing rooms to transmit video traffic over dedicated communications lines. Until now, Sproule said, equipment and dedicated line costs have prevented the firm from expanding the network beyond its major sites.

"The cost of videoconferencing equipment has been cut in half over the last two years; we can get good quality over a switched network, and the tariffs have dropped to give us switched connectivity cheaper than dedicated lines," Sproule explained.

Transmission costs using the System 4000 and switched facilities have dropped from \$400 to \$30 per hour, he said. However, the biggest value of videoconferencing to the firm is the time saved on corporate decision-making and turning around projects, Sproule said.

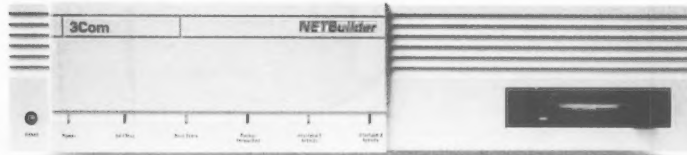
"If I cut 10 weeks off a project with a total [research and development] investment of \$100 million, the savings on the interest of that money alone could be \$2.4 million," he explained.

Cost cuts in travel and living expenses rank second, Sproule said. He said he figures that on a per-system basis, "if we have two to three conferences a month that would have otherwise resulted in travel, then we'll be at a break-even point with the System 4000."

Pictoretel introduced its System 4000 product family in January. The system, which is priced from \$39,500, integrates formerly separate components into one module.

Sproule said a key factor in the decision was a \$5,000 echo-canceling option that permits a person to wander anywhere in the room while speaking without audio degradation.

Changes.



NETBuilder's bridging, routing and brotouting offer top performance for local area connections and wide area connections.

The result is modular internetworking that lets you manage changes on your network intelligently.

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Continued from page 53

Local-area networking hardware

Cnet Technology, Inc. has announced a line of portable network interface adapters designed for Ethernet, Arcnet and token-ring networks.

The family includes the

CN50ET, a 10Base-T Ethernet model that supports unshielded twisted-pair cabling; the CN50E coaxial Ethernet adapter; the CN50A, an Arcnet adapter designed to support star and bus topologies as well as coaxial and unshielded twisted-pair cabling; and the CN50TR, a token-ring adapter that supports IBM Type One and Type Three cabling.

All models are scheduled to

begin shipping this month except for the CN50TR, which is slated to ship in July. Prices range from \$259 to \$699, depending on type of model.

Cnet Technology
2199 Zanker Road
San Jose, Calif. 95131
(408) 954-8000

Bravo Communications, Inc. has announced a series of devices de-

signed to protect local-area network components from power spikes or surges.

The Sure/Fire LAN Protectors series can reportedly protect components such as network adapter cards, transceivers, multiplexers, hubs and concentrators from in-line cable transients. The series includes Model BNC/LAN, a Bayonet Neill Concelman male/female

port protector for Ethernet/Thinnet Arcnet and token-ring ports, and Model RJ45/LAN, a device designed to protect twisted-pair Ethernet and Arcnet ports against transients greater than or less than 8 V.

Each model costs \$59.
Bravo Communications
1310 Tully Road
San Jose, Calif. 95122
(408) 297-8700

Visual Technology, Inc. has announced an imaging display station that supports thick or thin Ethernet local-area network connections via Transmission Control Protocol/Internet Protocol or Decnet protocols.

The X-19PQD is equipped with 2M bytes of memory. Its eight video planes feature 256 gray-scale levels. The product also includes a 19-in. monitor that features 1,280- by 1,024-pixel resolution at a 72-Hz refresh rate.

Pricing begins at \$4,495.
Visual Technology
120 Flanders Road
Westboro, Mass. 01581
(508) 836-4400

Network management

Blue Lance, Inc. has introduced a program designed to provide a complete audit trail for Novell, Inc. Netware-based local-area networks, including Netware 386-based LANs.

LT Auditor 386 (\$695) can reportedly be used to maintain security for programs or data within a network. It can also facilitate network troubleshooting and planning. The product can track users' log-ins and log-outs, file activities and files that were copied from local drives to network drives or vice versa.

Blue Lance
1700 W. Loop South
Houston, Texas 77027
(713) 680-1187

Gateways, bridges, routers

Fel Computing, a division of Fel Industries, Inc., has announced Lanlink-Decnet, a personal computer-based local-area network gateway that allows PC-LAN users to run Digital Equipment Corp. network applications.

The product provides users with complete protocol translation by converting any IBM Personal Computer AT, XT, Personal System/2 or compatible on a LAN into a dedicated high-speed gateway that connects directly to the Decnet Ethernet cabling.

Pricing begins at \$1,495 for a five-user kit. Ten-, 25- and 50-user versions or a site license can also be purchased.

Fel Computing
10 Main St.
Williamsville, Vt. 05362
(802) 348-7171

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Mannesmann Tally line printers: give you consistent high impact day after day, season after season. Built around a stored energy hammer bank, these all-pro performers deliver speeds from 450 to 1200 lines per minute.

Like a power hitter waiting for the fast ball, the stored energy hammer bank is constantly in position to penetrate volumes of heavy forms or other heavy duty printing... using far less electrical energy for higher reliability than other impact technologies.

Tough Versatile Performers for any Lineup.

MT645: 450 lpm—a strong utility player for bar codes, labels and industrial graphics. Use with mainframes, minis or PCs simultaneously through a shared parallel/serial I/O.

MT661: 800 lpm—fast and versatile, the best price/performance of any line impact printer, widest possible combinations of character fonts, styles, pitches and heights and the same shared I/O advantages of the MT645...even PC printer



emulations...perfect for LANs and distributed networks.

MT690: 1200 lpm—100,000 pages per month capability without sacrificing quality or your budget. A true workhorse performer and the lowest priced line printer in its class.

Special Offer FREE
Graphics Processing Option
(QMS® Code V™ compatibility)
with purchase of MT645.
\$800 Retail Value*

The Mannesmann Tally lineup is backed by a strong service organization that provides free installation and 90-day on-site service within a 100-mile radius of an authorized service center. (Extended on-site service also available.)

To send one of these high impact players in for your company, call our toll-free number for the name of the authorized Mannesmann Tally dealer in your area: **1-800-843-1347**.

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*Order must be placed through an authorized Mannesmann Tally Dealer on or before May 15, 1991. QMS is a registered trademark, and Code V is a trademark of QMS, Inc.

Digital's Network Application Support (NAS) leads the industry in providing a practical and easy way for you to share information and integrate applications across VMS, UNIX, MS-DOS, OS/2, and Apple Macintosh computers.

As you no doubt know, NAS is Digital's comprehensive set of open software based on industry standards. NAS supports industry-standard windowing so users can access applications in a consistent manner. With NAS, these applications can in turn access data and programs anywhere on your network.

Now, we've made distributed computing even easier to use with new extensions to NAS that allow developers to more easily build applications for distribution across multivendor networks. These new extensions to NAS include:

- DECmessageQ V1.0, an addition to the NAS Communication and Control Services that enables applications to communicate utilizing an innovative "message" queue
- The NAS Application Control Architecture (ACA) that allows developers to use object-oriented technology to link and distribute applications and information.

What It All Means to You: Optimizing System Resources

What do these new NAS extensions mean for you?

With DECmessageQ, an implementation of NAS Interprocess Queuing Services, developers can optimize system resources by building modularized applications split into separate programs to run on different systems. DECmessageQ also lets people work more productively. For instance, by using DECmessageQ, you could integrate information from an order entry application with an inventory application written for a completely different computer system.

With Digital's Application Control Services implemented on ACA, rather than creating

New

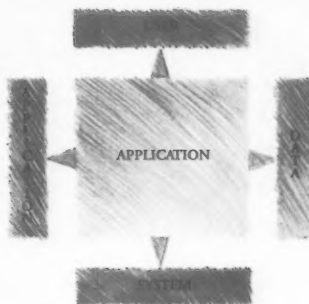
NAS Extensions for Distributed Applications: Making Distributed Computing Even Easier

Communications & Control

- Mail Services
- Electronic Data Interchange Services
- Interprocess Queuing Services
- Application Control Services

Application Access

- Windowing Services
- Forms Services
- Graphics Services
- Terminal Services



Information & Resource Sharing

- Compound Document Services
- Data Access Services
- Repository Services
- File Sharing Services
- Print Services

System Access

- Distributed Computing Services
- Portable Operating System Interface

▲
Network Application Support (NAS) services have been extended to allow developers to more easily build applications for distribution across multivendor networks.

For More Details

The following information should be helpful in planning your implementation of DECmessageQ. For more complete details on the new NAS extensions, please contact your Digital sales representative.

VMS licenses for DECmessageQ are available in three packages:

DECmessageQ for VMS/Development
Part # QL-GKPA9-J; \$12,000

DECmessageQ for VMS/Run-Time
Part # QL-GHVA9-J; \$4,000

DECmessageQ for VMS/LU6.2 Services
Part # QL-GKQA9-J; \$9,000

Two ULTRIX licenses are available:

DECmessageQ for VAX ULTRIX
Part # QL-GHUA-AA; \$9,000

DECmessageQ for RISC ULTRIX
Part # QL-GHTA-AA; \$4,000

Other available licenses:

DECmessageQ license for MS-DOS 1.0
\$200

DECmessageQ license for OS/2
\$250

More News on NAS

OSF DCE Fully Integrated into NAS

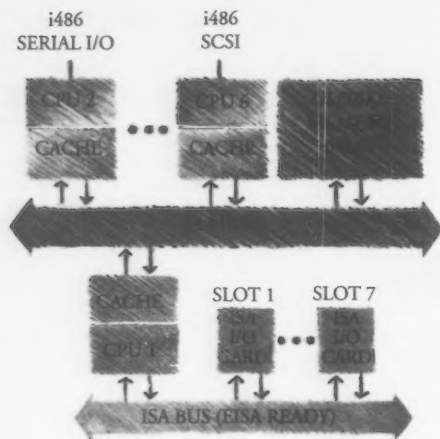
Digital will be delivering the Open Software Foundation's Distributed Computing Environment (DCE) components as an addition to its NAS System Services. By basing its DCE on the OSF guidelines, NAS will provide a consistent programming environment for developers — one that will be independent of both network and operating system as well as compatible with existing

computer environments. Digital will be implementing the integrated DCE product across both its VMS and ULTRIX systems.

NAS Documentation Set Now Available

Designed to help Digital customers and software vendors design NAS applications, the six-volume NAS Documentation Set is available in both hardcopy format and on CD-ROM. The set is priced at \$60. For easy ordering, the part number is QA-GCNA-A-GZ1.0.

The applicationDEC 433MP System



Ready to Run continued ►

the growth rate of your business. In all multi-user environments, from timesharing through network and PC LAN Server, the applicationDEC 433MP system allows transparent growth by simply adding processors, memory, and disks when you need them. No need to change application software; no need to change systems, retrain personnel, suffer extended system interruptions, or retire existing hardware.

Tailor-Made for High Performance

With two high-performance CPU options, the applicationDEC 433MP system allows you to tailor systems to meet specific demands for higher performance. A high-performance i486 CPU with integral SCSI adapter can be added for environments requiring increased CPU and disk performance. A second high-performance i486 CPU with integral 32-user serial I/O support can be added to provide increased multiuser efficiency. In all, the applicationDEC 433MP system can support up to six i486 processors.

Any processor can work on any task, allowing the system to absorb variable workloads.

The applicationDEC 433MP system comes with the industry-standard ISA bus with seven slots for boards to access thousands of available devices, such as token rings, scanners, disks, and printers. The system's EISA-ready bus allows for a future upgrade to a full EISA system if required.

Full Service Too

The applicationDEC family of products is fully supported by Digital's customer services organization, offering the choices and levels of service provided with other Digital products. Digital also supports the SCO UNIX operating system and selected layered software with both telephone and on-site service around the world.

Contact your Digital representative for more information on the applicationDEC 433MP system.

NEWSFLASH

MARCH

april

may

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july

august

september

october

november

december

january

february

New Software Centers Open

Over the next few months, Digital and four major industrial distributors will be establishing facilities in 11 U.S. cities where small and medium-sized software companies can port their products to Digital's ULTRIX for RISC workstation platform — at no cost. Participating distributors include Avnet Computer, Pioneer Standard Electronics, Pioneer Technologies, and Wyle Laboratories. The centers will be located on site at distributor offices in Atlanta, Baltimore/Washington area, Boston, Chicago, Dallas, Denver, Detroit, Los Angeles, New York/New Jersey area, Orlando, and San Francisco. Call 800-DEC-ISVN (800-332-4786) for more information or to schedule time in the porting center nearest you.

DEC FUSE: New UNIX-Based CASE Tool

Digital recently extended its COHESION software development environment by adding DEC FUSE to its family of UNIX-based CASE tools for RISC systems. As a visual CASE tool set for DECstation and DECsystem platforms, DEC FUSE for ULTRIX provides an interactive, graphically-oriented UNIX programming

environment. It also integrates new and existing tools, creating a stimulating, intuitive environment for software development. These tools can make programmers much more productive by maximizing the power of workstations, and by integrating and presenting development tools in a visually exciting way.

SCSI Savings

Are you running data-intensive applications that require large file access? Or perhaps multiuser applications that require high throughput? If so, the high-capacity, high-performing SCSI drives you need are now more affordable than ever:

RZ24	209MB formatted 3.5" internal fixed disk	Now \$2,500 SAVE 17%
RZ57	1GB formatted 5.25" external disk with expansion box	Now \$7,500 SAVE 30%

In addition, the basic monthly charge on the RZ57 has been reduced by almost 30 percent.

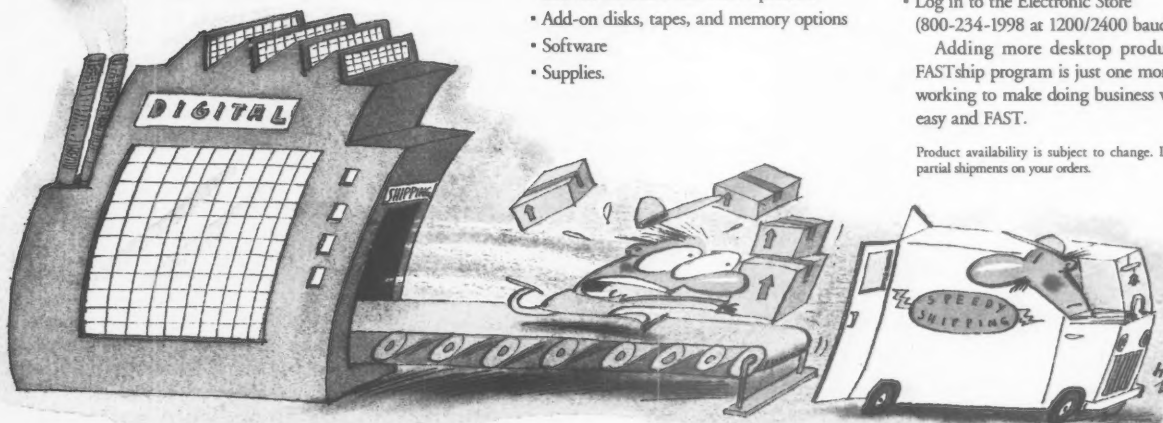
DEClaser Printers for the 90's

You can print all your correspondence on Digital's flexible, inexpensive DEClaser printers. These user-friendly printers are designed to print both envelopes and letters in the same job. Best of all, since the envelope is printed right along with the letter, collating becomes a much easier, more error-free task. The entire family of DEClaser printers offers this efficient capability, including the DEClaser 2100/2200 and the new DEClaser 2150/2250. (If you're using the DEClaser 2100/2200 ANSI models, ask your Digital salesperson about the ASSETS program package for ANSI Setup Modules that makes this letter and envelope process happen even faster.)

For fast, easy ordering and information on these and other Digital products and services, call 800-DIGITAL (800-344-4825). For answers to your technical questions, call our Technical Consulting Center at 800-343-4040.

When You're Ready to Order
Desktop Products, and
You Need Them **FAST**,
Say:

"FASTship please."



We've recently expanded the number of desktop products now available via the FASTship program to include:

- Most of our prepackaged VAXstation workstations, including the VAXstation 3100
- Our most popular prepackaged DECstation workstations, such as the DECstation 2100, DECstation 3100, and DECstation 5000
- Many of our PC integration products, including our newest Ethernet controllers
- Terminals, like the VT420 (a recent *Digital Review* Target Award winner)
- Printers, including the LA70 personal printer and the DECtaser 2100/2200 printers
- Add-on disks, tapes, and memory options
- Software
- Supplies.

This means you can have the desktop products you need shipped by the end of the next business day after you've placed your order. As with all FASTship orders, there's no extra charge. All discounts and trade-in agreements apply. Plus, you can better control your inventory by reducing carrying costs, knowing that Digital can ship this FAST.

It's Easy to Order FASTship

To place an order FASTship, or to confirm which products are available for FASTship:

- Call 800-DIGITAL (800-344-4825), or
- Log in to the Electronic Store (800-234-1998 at 1200/2400 baud).

Adding more desktop products to our FASTship program is just one more way we're working to make doing business with Digital easy and FAST.

Product availability is subject to change. Please allow for partial shipments on your orders.

InfoServer 100

Right Data, Right Place, Right Time

The recently announced CD-ROM-based InfoServer 100 is a dedicated server that attaches directly to thick or ThinWire Ethernet, giving direct data access to any client connected in a local area network.

The InfoServer 100 CD-ROM server is the first in a family of Digital products designed to provide an outstandingly simplified software and information delivery system. It is compatible with all VAX VMS platforms, and is cluster independent. It offers local area network access to libraries of software and documentation, as well as training on CD-ROM. Users can easily take advantage of Digital's comprehensive VMS Consolidated Distribution Software, VMS Online Documentation Library, company databases, the DECUS software library, and more.

The InfoServer 100 makes it easy to distribute information, and to do VMS and layered product installations and upgrades. Because there are so many products on a disk, there's no need to load and unload media. Installation time is reduced, and

everyone is kept up-to-date on the latest revisions. Systems managers can keep a handle on critical information while at the same time letting users access it with ease. Central control, local freedom — an ideal solution.

Product Information:

InfoServer 100 with 1 RRD40 drive
Part # SEABB-AA; \$8,300

InfoServer 100 with 2 RRD40 drives
Part # SEABC-AA; \$9,300

Each of the above packages includes the InfoServer system with InfoServer software and license, four client licenses, the current editions of Online Documentation on CD media, Consolidated Distribution on CD media, and DEClearn on CD media. There are also two coupons included — one for \$500 off the price of the yearly subscription to Online Documentation and one for \$500 off the price of the yearly subscription to Consolidated Distribution. To order, or for more detailed information on the InfoServer 100, call 800-DIGITAL (800-344-4825).

As a Matter of Fact

Here are the latest statistics
on Digital's worldwide network
customer installed base.

Through December 1990, Digital has shipped:

- 777,000 DECnet licenses
Cluster and site licenses counted as one unit.
- 998,000 total Ethernet nodes
Sum of all Ethernet controllers plus communications servers; all devices attached to cable plant.
- 4,246,000 Ethernet terminal ports to
78,000 Ethernet customer ship-to
locations worldwide

Numbers are worldwide revenue shipments to Digital customers and do not include Digital's internal networks. Data source is PFR database. All data reflects cumulative unit shipments.

digital update

NEWS AND VIEWS MARCH 1991

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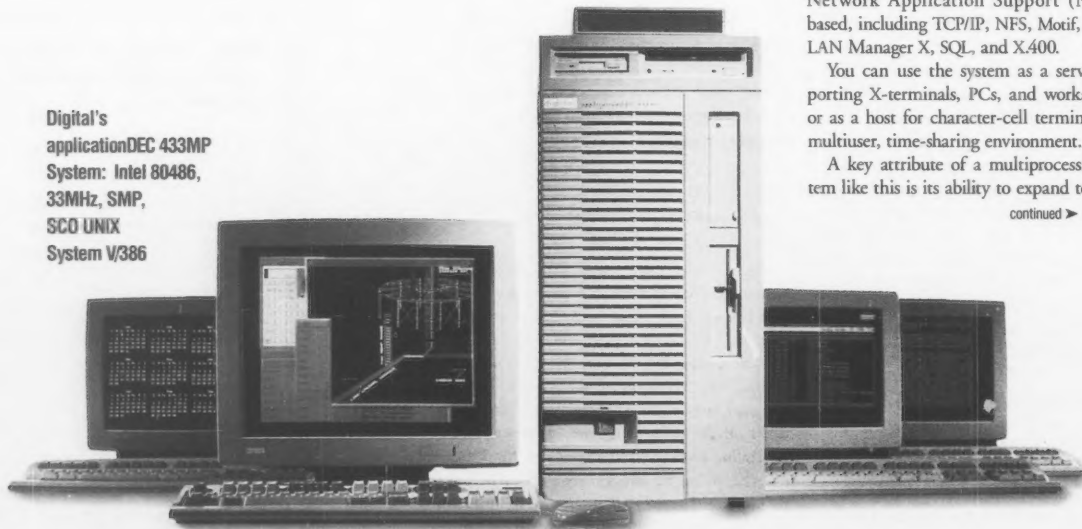
Geared toward the needs of small and mid-sized businesses, the applicationDEC 433MP system supports many of the same industry standards on which Digital's Network Application Support (NAS) is based, including TCP/IP, NFS, Motif, POSIX, LAN Manager X, SQL, and X.400.

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A key attribute of a multiprocessing system like this is its ability to expand to match

continued ►

Digital's
applicationDEC 433MP
System: Intel 80486,
33MHz, SMP,
SCO UNIX
System V/386



MANAGER'S JOURNAL

EXECUTIVE TRACK



Martin A. Morris Jr. has been promoted to assistant vice president of the information systems department at **Amsouth Bank NA** in Birmingham, Ala.

Morris joined Amsouth in 1989 as a systems engineer. He previously held positions at El Paso Natural Gas Co. in El Paso, Texas, and Aramco in Dhahran, Saudi Arabia.

Irad "Terry" Hardy has been promoted to corporate vice president of operations systems at Minneapolis-based **National Car Rental System, Inc.**

His new position will focus on the evaluation of physical plant and operating processes, with emphasis on improving operational efficiencies. Most recently, Hardy had overseen the implementation of National's enhanced technology in its Rochester, Minn., license operation, including its Smart Key Machine computer-based self-service rental service.

Hardy joined National in 1987 as northeast regional manager. He had previously worked for Avis, Inc.

Priscilla Tate has been named the first executive director of the **Microcomputer Managers Association**, a New York-based group of about 1,000 professionals involved in personal computer technology management.

Tate is president of Tate-Austin Associates, a strategic planning and market research firm she founded in 1988. She has held IS positions at the former E.F. Hutton & Co. and at Manufacturers Hanover Trust Co.

She holds a bachelor's degree and a master's degree from Duke University.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Recasting IS for the 1990s

Consultants preach technology/business linkage, but are executives ready to listen?

BY NEEL MARGOLIS
CW STAFF

From its headquarters in an 18th century townhouse on Boston's historic Beacon Hill, a 3-month-old corps of "consultants' consultants" is eyeing the information systems function of the future — and attempting to mold business/information leaders flexible enough to supply it.

"Everybody talks about 'information' business, about bridging the gap between information technology and business culture, but nobody is really doing it," says Alan Stanford, national director of IS consulting at accounting and consulting firm Ernst & Young.

Two years ago, Ernst & Young's management committee decided to try to be the one to "really do it." As its vehicle, the committee carved out an autonomous consultancy-to-the-consultancy aimed at toppling the barriers between business and technology.

In December, doors opened at the Ernst & Young Center for Information Technology and Strategy, a blue-ribbon consulting boutique. A separate compensation scheme that removes competition with other Ernst & Young colleagues ties center partners' successes to their ability to aid their nationwide colleagues with the fruits of high-level, multidisciplinary strategizing.

The center's 40-person lineup includes among others Managing Director Bernard F. (Bud) Mathaisal, fresh from his stint as turnaround chief information officer at Walt Disney Co.; former McKinsey & Co. banking technology consultant Diogo Teixeira; former

Index Group Research Director Thomas Davenport; and computer-aided software engineering (CASE) maven Vaughan Merlyn, who became an Ernst & Young partner in January when he merged his CASE research firm into the center.

The center's goals are simple to state but accomplishing them could prove to be far from easy. Not least among the barriers facing the fledgling outfit is the reality that the IS world might not be ready to be recast.

"Most IS people still have a very narrow view of their responsibilities," concedes center partner Philip Pyburn. "The client for most of the work we've done in the past 10 months isn't the IS person; it's the CEO."

To help him and his clients through what could be a bumpy ride from status quo to status desira, Pyburn says he is relying heavily on three attributes he learned during his days as a software company entrepreneur: "Patience, patience and more patience."

At Society Corp., a \$16 billion Cleveland-based bank holding company

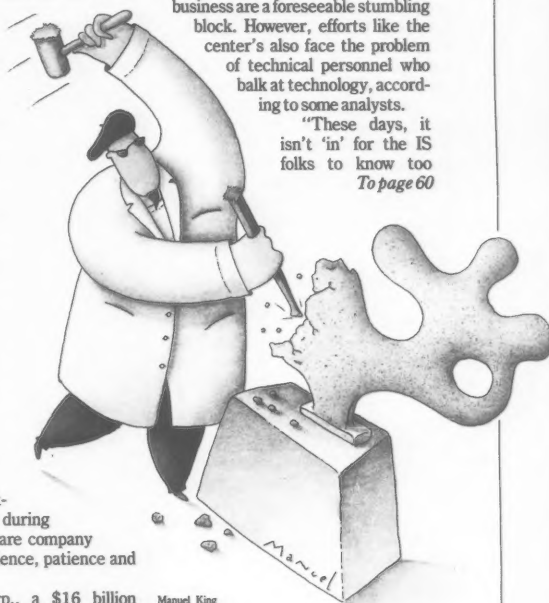
that inadvertently became a beta-test site of sorts for the center's services, the top IS executive admits that much of the world may not be ready for the center's view, but he is.

"There's still a lot of 'not invented here' attitude in some IS shops," says Alan Gula, executive vice president of information technology. "But I don't care where it's invented. If I can leverage it, bring it on."

Technical personnel who balk at business are a foreseeable stumbling block. However, efforts like the center's also face the problem of technical personnel who balk at technology, according to some analysts.

"These days, it isn't 'in' for the IS folks to know too

To page 60



Wall Street: IS 'not a big deal' to bottom line

BY CLINTON WILDER
CW STAFF

Senior business executives' understanding and awareness of information technology continues to rank among the top concerns of information systems managers. But what about Wall Street security analysts, whose opinions and earnings projections can send company stock prices soaring or plummeting?

Michael Norwich, a senior manager in the New York office of IS consulting firm Nolan, Norton & Co., has been pondering that question. He got curious about security analysts' perceptions of IS while researching the topic of outsourcing for William Kelvie, a former Nolan, Norton consultant who is now the head of IS at the Federal Na-

tional Mortgage Association.

In researching the outsourcing moves of large organizations such as Eastman Kodak Co. and H. J. Heinz Co., Norwich interviewed several analysts who follow the companies. Although opinions varied, the general consensus was that IS was "not a big deal" to the bottom line.

"I would say they are starting to realize its importance, but it's an intangible," Norwich noted. "It's not something they can value in cents per share."

Kodak's landmark outsourcing announcement in 1989, for example, was huge news in the IS world, but it did not cause even a ripple in Kodak's stock price. Placing a specific value on IS has so far proven to be as elusive for Wall Street analysts as it has for chief financial officers and business executives.

Therein lies a chicken-before-the-egg dilemma, according to Norwich. Security analysts deal with executives at that level; if the executives are not well-versed in the IS activities at their companies, or if they are not big believers in technology, the analysts will not raise the issue with that organization.

By the same token, Wall Street's IS awareness level will probably rise as efforts to quantify IS benefits (or lack thereof) proliferate. Nolan, Norton, for example, recently completed a one-year project working with a dozen companies to develop new metrics for corporate performance, including IS. As those types of metrics become perfected, security analysts' interest in IS should increase.

"They have a sense that it's important," Norwich said, "but they can't quite get their arms around it. It's still an early point in time" on the measurement curve.



Recasting

CONTINUED FROM PAGE 59

much technology or to hang around with the techies," notes Bruce Rogow, executive vice president of worldwide analytic resources at Stamford, Conn.-based market research firm Gartner Group, Inc. His own propensity to "wallow with the techies," Rogow says, causes raised eyebrows among CIO friends.

A recent Gartner Group survey of CIOs, he says, showed the respondents spending 30% of their time on "the business of the business" and 40% practicing "management by walking around."

While the remaining 30% was "spent with the technology team," Rogow notes, the lion's share of that portion was devoted to administrative and managerial matters within the IS department. A mere 3% to 5% of total time per CIO was spent learning new technology.

Growing competition

While the center's market may not be ripe, the competition for that market is budding. Across the Charles River from the Ernst & Young Center, for instance, management consultancy Arthur D. Little, Inc. in Cambridge is also preaching the gospel of a new information-informed corporate order built on principles of business/IS linkage. In fact, the linkage concept is more likely to emerge as one of the dreaded buzzwords of the early 1990s than to offer any of its proponents a claim to consulting distinction.

Meanwhile, however, the technologically savvy executives and businesswise IS heads whom the center sees as joining to write tomorrow's corporate success stories are out there — if not yet in profusion — to be found and fostered by the center's approach, Gula says.

Society sought the services of Ernst & Young's IS consulting division back in 1988 when a homegrown attempt to cre-

ate an IS strategy for the firm's corporate banking unit went awry. The business unit "wanted a narrow focus," Gula says, "while IS wanted the big picture. It was a marriage made in hell."

Society turned to Stanford — then pioneering the concepts that would later be embodied in the center — to help bridge the gap. Stanford's approach was based on the assumption that information means and business ends must inextricably serve each other from the start and must be implemented by professionals who understand and embrace not one or the other but both. That



Pyburn preaches patience as the key for IS success

turned thinking on its head in Society's corporate banking and IS groups, Gula said.

Fired up by new understanding of the people who used to be written off by the technical personnel as "suits," Gula says he told his IS department, "You work for a bank: I want you to look, act and talk like bankers. That alone, he says, "opens more doors than you might guess."

The learning process went both ways. "The first surprise [for the bankers] was that they thought they really understood everything about their business priorities — but they learned there was more," Gula

says. "They came in with a good tactical view, but by the time you implement a tactical plan, the business has changed."

Knocking down the cultural walls helped the bankers and technical people discover that Society already had most of the information capability it was poised to buy, Gula says. Instead of "spending millions to update or replace our core systems," Society was able to plan a project that would make information from five core systems available to bankers using IBM OS/2-based workstations with Easel Corp. touch-screen interfaces.

The process saved "years and seven figures worth" of development effort, Gula says. "We found that 80% of the information [the bankers] needed already existed; we just weren't delivering it."

The Closer You Look At Software For The



Luxuries of home?

Ernst & Young's Center for Information Technology and Strategy is attempting to seed the IS/business infrastructure of the future from a Charles Bulfinch-designed townhouse planted firmly in the past.

However, consultants said the center's physical plant — if such a phrase can be used to describe several floors of serpentine staircases, oriental carpets, brocaded settees and burnished antique accoutrements — is strategic.

"We wanted an atmosphere that would both attract and be comfortable for the senior-level corporate executives we expect as our clients," says Bud Mathaisal, managing director. That meant an intellectual climate conducive to contemplation and exploration, luxurious but with roots, redolent of power through innovation. When it comes to the building, the medium is the message.

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Survey: Medical IS lags behind other industries

BY CAROL HILDEBRAND
CW STAFF

Although information systems is bulking up its profile in hospitals nationwide, the overall effect is more likely to get you your bill faster rather than send you home more quickly.

According to a survey conducted by Hewlett-Packard Co. and the Healthcare Information and Management System Society (HIMSS), the driving factor behind increased use of computers in 43% of surveyed hospitals is improving operational efficiency rather than improving patient care, which was second at 26%.

The survey, which polled more than 400 IS executives at the HIMSS conference last month, tracked general opinion on the state of technology in the health care industry.

Most said they thought health care IS managers were playing catch-up when it came to technology: More than 80% considered hospitals either somewhat or significantly behind other industries in applying computer automation. However, budgets were slated to meet that process. Sixty-two percent predicted that their budgets would increase either somewhat or substantially.

Fifty-four percent of those polled

chose integrating departmental systems as the most important problem facing them in the next two years; 86% tapped the issue as being either imperative or very important, with 56% planning to use in-house staff to get the job done.

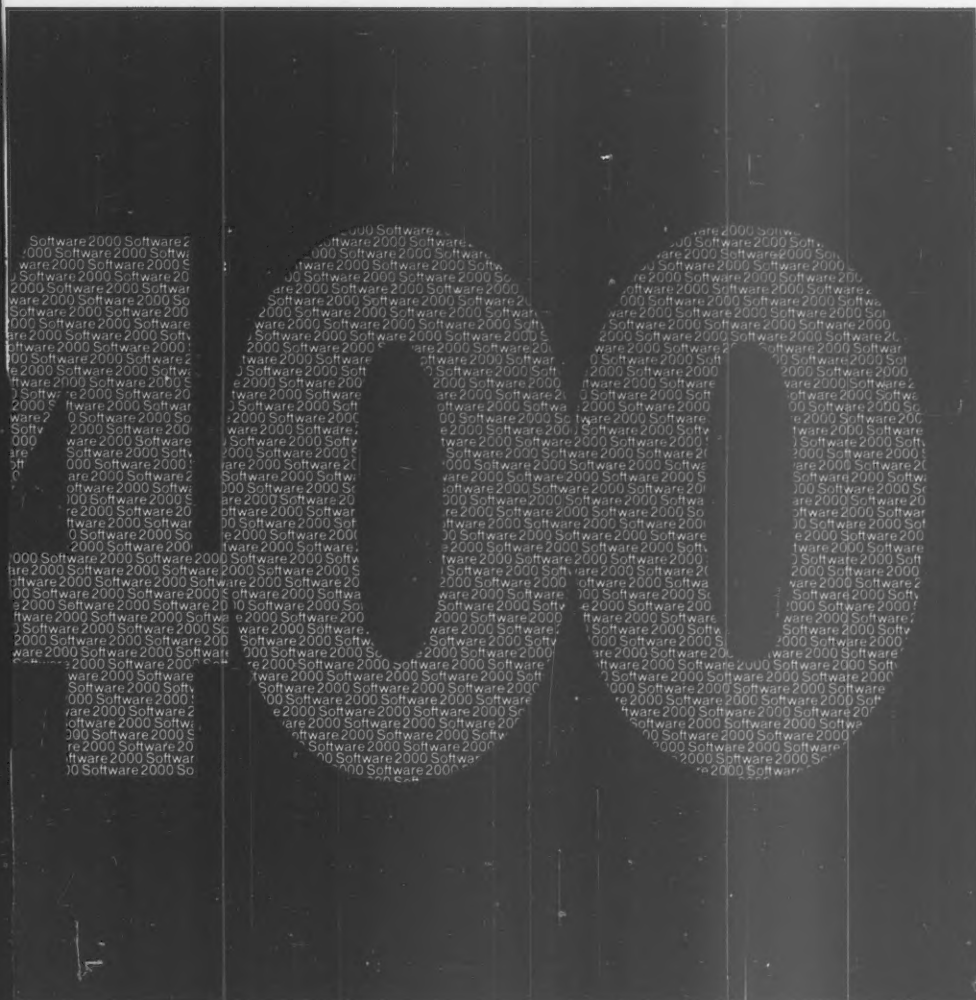
Although they are counting on open systems to help make this job easier — 70% expect open systems to have a positive impact on their departments in the next five years — 84% said the computer industry has failed to explain potential benefits. Moreover, 74% said they did not have a firm grasp on the impact emerging standards such as Systems Network Architecture and Open Systems Intercon-

nect will have on their departments.

HIMSS members said they saw hospital efficiency increasing through the use of on-line medical records for patients, which 77% predicted would have great potential. The advance in technology that would bring more computers into hospitals was a friendlier user interface (50%), with 24% opting for voice recognition.

Greater ease of use could have an effect on the attitudes of hospital personnel toward IS: Physicians currently do not have an open mind about using computers. On a scale of one to five, 41% of doctors were rated in the bottom two tiers when it came to willingness to try new technology. High scorers were administrators: Sixty percent were rated as being open-minded.

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MANAGEMENT BRIEFS

Skeptical view of outsourcing

The concept of outsourcing may be having an identity crisis. A survey released last week found that many information technology executives who have not outsourced their operations view outsourcing as a management failure.

The survey, conducted by University of North Carolina at Greensboro researchers on behalf of outsourcing provider The Genix Group, drew responses from 30 senior technology executives at large companies.

More than half of the respondents cited lack of flexibility as one of outsourcing's biggest drawbacks and lack of control as a major drawback. One-third said they lacked confidence in their vendors.

The researchers also said new roles are emerging for information systems executives. They cited as existing roles what they called the "traditional" role, in which an executive is responsible for operations and systems development and maintenance, and "strategic," in which executives are primarily involved in business strategy. The emerging roles are "transitional," in which an executive is trying to move toward a strategic position, and "strategic equilibrium," in which an executive and the company are reaping the benefits of strategic systems.

A division of the American Society for Quality Control (ASQC) recently announced that it is developing guidelines for computer-integrated quality information management systems. The society's Computer Applications Committee hopes to help companies plan, develop or select, and implement computerized quality information systems, which were designed to manage quality in manufacturing environments. A symposium is planned for October. For more information, contact Camille Spampinato, ASQC Computer Applications Committee, 575 Ewing St., Princeton, N.J. 08540.

COMMENTARY

Robert Zawacki

Microwave management



Thoughts on information systems management are not often sparked by the food at a dinner party, but you never know.

On a recent trip east, a client invited my wife and me to have dinner with her and her husband. As we started our salads, she got up from the table and placed a small loaf of frozen bread in the microwave oven.

My thoughts immediately went back 45 years to my early childhood on a small dairy farm in northern Wisconsin. Every Wednesday, my mother started making bread for the next week. She lovingly kneaded the dough, placed it in pans to rise to the correct height, then placed the loaves in the wood stove.

On my walk home from school, I could smell the freshly baked bread when I passed through a small creek valley about a quarter of a mile from home. When I entered the house, the entire kitchen table was covered with golden loaves. To this day I can still smell and taste that bread.

My mother took no shortcuts. I didn't want to tell our hostess, but her

organizations, we take the best IS staff member and make him the leader. The skills of an effective technician are different from the skills of a leader, yet in many organizations, we let new leaders learn on the job at the expense of their individual contributors.

Further compounding this selection process, IS people have a high need for things and not people. They come from a binary world with finite solutions and fixes to complex technical problems — a world of certainty. Placed in a leadership role, they are looking for the latest quick fix because that is their mental set and training.

What must an all-day leader do? My research indicates that leaders can hit 80% of the human needs by concentrat-

ing on five key behaviors.

First, the leader should attempt to match people and jobs. Between 50% and 60% of a person's motivation is the match-up between the person and the job. The vast majority of people want to work and will make a major contribution to the organization if they have challenging work to do.

Second, set goals that are challenging but reachable in a reasonable period of time. Third, give good feedback on goal accomplishment. Fourth, give workers the autonomy to perform and follow up with good feedback. Fifth, after feedback, the workers expect rewards to follow good performances. It is not only the absolute amount of the reward that workers look at but also the fairness of the re-

ward. They compare what they received to what others received for their level of performance.

Good leadership, like good bread baking, requires attention, patience and care all day long. IS has the talent to succeed in the 1990s, but it needs leaders who understand how to motivate employees and how to create a culture in which people contribute their best effort because they believe the system rewards excellence fairly. Those IS organizations that manage their human resources better in the 1990s — and eschew the quick fix — will have a strategic competitive advantage.

Zawacki is a professor of management and international business at the University of Colorado.

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microwaved bread was not the same.

My point is that IS managers are looking for quick fixes to today's complex problems. They turn to fads such as one-minute management, quality circles, entrepreneurial management or management by objectives.

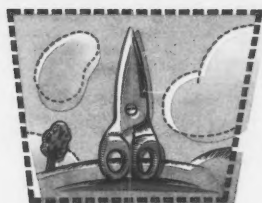
Unfortunately, many IS managers are trained and rewarded based on quick fixes, and microwave management appeals to them. But we don't need one-minute managers. We need full-time managers who will work with their individual contributors in the 1990s to increase motivation, productivity, service and quality.

In the 1990s, we will continue to have the engineering and scientific talent to develop leading-edge technologies in America. Although I am concerned about America's low personal savings rate and the low investment in research and development compared with the Far East and European countries, we need to concentrate on our people.

What America must do to maximize the impact of our technology in the 1990s is to manage its human resources better. The human costs in a typical IS organization make up about 50% of the total budget. Many of these firms will spend millions of dollars for computers and software, yet they will not invest \$25,000 in a good selection or training system.

Why this incongruity? In most IS

CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"Strategic alignment: A model for organizational transformation via information technology"

By John Henderson and N. Venkatraman

MIT Center for Information Systems Research
Working paper 1990

■ Obtaining a competitive advantage through the use of information systems requires management attention to four areas of the business: external strategy, the IS strategy, the internal IS operation and the business' internal structures and processes.

It is important to distinguish between the externally focused IS strategy, such as American Express Co.'s decision to use imaging technology to enhance its monthly statements, and one focused on the internal IS infrastructure, such as Eastman Kodak Co.'s decision to out-source data center operations.

Concentrating only on blending strategic-level business and IS issues and overlooking infrastructure concerns, such as a technical migration problem, may doom that hot new IS project.

A full-fledged "strategic alignment" of business and technology requires the concurrent attention to all four domains on a continuing, dynamic basis. — *Mitch Betts*

"Where does prototyping fit in IS development?"

By Stuart Gavurin

ACM Journal of Systems Management
February 1991

■ Although the concept of prototyping has been around for decades, only recently has it been used in the design of information systems. The more traditional methodology of system design are the steps known as the Systems Development Life Cycle — feasibility, analysis, definition, design, development, implementation/evaluation and maintenance.

For its part, prototyping enables developers to construct a skeletal model of the system, going through the life cycle's first five steps more quickly.

Prototyping is most effective in gathering systems requirements. Users gain an understanding of the system through the prototype, enabling them to communicate their requirements to developers.

What prototyping does not do is provide a structured approach to systems design, making it easy to neglect documentation. It may be hard to convince users who become familiar with the prototype version not to adopt this early system because it lacks functionality.

When should you use prototyping? Prototyping is useless in the case of batch transaction processing systems, which have a high degree of structure and activity and do not have any user interface requirements. On-line systems are good candidates for prototyping because they need interfaces, such as screens, to help users effectively use them.

The best approach is to use prototyping in conjunction with Systems Development Life Cycle. The life cycle can provide control for system development, while prototyping can concentrate on system design. Benefits of this blend include improved communication between users and developers as well as better control over producing a usable system. — *Jodie Naze*

"End-user computing in a CASE environment"

By Chang-Yang Lin and Chen-Hua Chung

Journal of Information Systems Management
Spring 1991

■ Building complex applications in a computer-aided software engineering (CASE) environment is a mainstay of IS. However, users can become more involved in CASE and help IS reduce departmental backlogs. With CASE training, users can develop ad hoc query and reporting applications as well as simple applications at the work-unit level.

A user-oriented CASE tool should incorporate the following elements:

- Applications generation through the direct manipulation of icons representing reusable code.
- Fourth-generation language features of prototyping technology and interactive mode.
- Few user interfaces, a standard CASE environment and support for intertool interfaces.
- Expert systems as guides for effective CASE use. — *Lory Zottola*

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Focus on Operations XI. Las Vegas, April 7-11 — Contact: Computer Operations Management, Orange, Calif. (714) 997-7968.

IEEE International Conference on Robotics and Automation. Sacramento, Calif., April 7-12 — Contact: Robotics and Automation, Boca Raton, Fla. (407) 483-3037.

Service Trends Conference. San Francisco, April 8-9 — Contact: Lori Larsen, Ledgeway/Dataquest, Lexington, Mass. (617) 852-8506.

Information Security Managers Symposium. Chicago, April 8-10 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Loop Implementation: The Next Steps. Monterey, Calif., April 8-10 — Contact: Electroncast, San Mateo, Calif. (415) 572-1800.

Computers and Software for Manufacturing Expo. Chicago, April 8-11 — Contact: Doug Kunz, Cahners Exposition Group, Stamford, Conn. (203) 352-8202.

National Design Engineering Confer-

ence. Chicago, April 8-11 — Contact: National Design Engineering, Stamford, Conn. (203) 964-0000.

CSC Exchange. Cambridge, Mass., April 8-12 — Contact: Margaret Murphy, Computer Sciences Corporation Exchange, Cambridge, Mass. (617) 499-1227.

The Conference Board Information Management Conference. New York, April 9-10 — Contact: Conference Board Registrar, New York, N.Y. (212) 339-0290.

Seybold Technology Forum. Cambridge,

Mass., April 9-11 — Contact: Deborah Hay, Seybold Computing Group, Boston, Mass. (617) 742-5200.

The Software Development Management Conference. San Francisco, April 9-12 — Contact: Software Development Conferences, San Francisco, Calif. (415) 995-2471.

Supercomputer Conference. Newport, R.I., April 9-12 — Contact: John Miguel, Federal Information Processing Council, Middletown, R.I. (401) 841-4591.

Society for Information Management 1991 Institutional Member Conference. Tucson, Ariz., April 10-12 — Contact: SIM, Chicago, Ill. (312) 644-6610.

Unix Challenge 1991. Tyngsboro, Mass., April 10-12 — Contact: Andre Fontaine, Boston University, Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Voice '91. Anaheim, Calif., April 10-12 — Contact: Voice '91, Houston, Texas (713) 974-6637.

APRIL 14-20

Congress on CIM Databases. Cambridge, Mass., April 14-17 — Contact: Wilma A. Hurwitz, CAD/CIM Alert, Boston, Mass. (617) 232-8080.

International Technical Communication Conference. New York, April 14-17 — Contact: ITCC, Thornwood, N.Y. (914) 742-5999.

Information User Association: Architecting for the '90s. Salt Lake City, April 14-18 — Contact: IUA Headquarters, Chicago, Ill. (312) 644-6610.

Nastec 3.0. Atlanta, April 14-19 — Contact: Dave Cochran, National System Programmers Association, Milwaukee, Wis. (414) 423-2420.

Comten Users' Exchange. Baltimore, April 15 — Contact: Ron Block, CUE, New York, N.Y. (212) 633-5080.

Cadtech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4256.

Knowledgeware International User Conference. Atlanta, April 15-17 — Contact: Knowledgeware, Atlanta, Ga. (404) 231-8575.

Securtech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4256.

Wireless Data Networks Conference. Washington, D.C., April 15-17 — Contact: Business Communications Review, Hinsdale, Ill. (800) 227-1234.

Lap & Palmtop '91. New York, April 16-17 — Contact: Peter O'Connor, Laptop Expositions, New York, N.Y. (212) 682-7968.

Downsizing Conference: Moving from Mainframes to PCs. Boston, April 16-17 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Electro/International. New York, April 16-18 — Contact: Alexes Rzevich, Electro/International, Los Angeles, Calif. (213) 215-3976.

IMSL User Group Europe Conference. Paris, April 17-19 — Contact: Karen G. Mender (713) 782-6060.

Instore Systems: The Key to Better Customer Service. Orlando, Fla., April 17-19 — Contact: National Retail Federation, New York, N.Y. (212) 563-5113.

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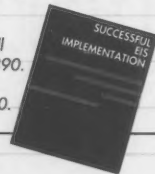
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EXECUTIVE REPORT

EVALUATING ADVANCED TECHNOLOGIES

The needing edge

Despite economic blahs, forward-looking companies keep exploring ways to find tomorrow's business solutions

BY ALICE LAPLANTE

During an economic downturn, when many companies are slashing budgets and staffs, you'd expect investigation of such technologies as multimedia, handwriting recognition, CASE, imaging and expert systems to grind to a halt.

Right?

Wrong.

"We've been amazed at how robust interest in emerging technologies has been," says Bill Caffery, vice president and director at Gartner Group, Inc.'s Advanced Technology Group in Stamford, Conn.

Despite a tough economy, it appears that many information systems organizations are willing to put aside (or at least live with) concerns about buggy technology, the financial stability of small specialized vendors or the lack of standards that usually dogs advanced technology. Record numbers are creating advanced technology groups, and many user departments are now doing their own exploring. The reasons seem to be good planning — and healthy fear.

"Technology changes so quickly, we can't afford — for competitive reasons — not to track it," says George McCall, vice president of planning and administration for IS at San Antonio-based insurer United Services Automobile Association (USAA). "There is no doubt that we would lose money — not to mention a competitive edge — in the long run if we failed to keep on top of newer technologies."

Critical to success

Indeed, a poll of *Computerworld* Premier 100 winners, judged to be the nation's most effective users of information technology, showed that nearly three-fourths considered leading-edge technologies to be "critical" or "very important" to their competitive success.

LaPlante is a free-lance writer based in Palo Alto, Calif.



Alan Levenson

Southern California Gas' Holmes: 'All too often, new technology becomes a solution in search of a problem.' Proceeding that way can be a backwards approach, he says

According to Gartner Group, start-ups of advanced technology groups are widespread and growing rapidly. A recent Gartner Group survey of 268 U.S. companies showed that 27% had either a full- or part-time advanced technology group. More than 40% of larger firms had a full-time group. A study by Index Group, Inc. in Cambridge, Mass., places the figure closer to 50%.

"Frankly," Caffery says, "our expectation was that activity in this area would slow, but we've found that the typical company tends to be more aggressive, taking a long-term view toward the importance of keeping an eye on advanced technology."

Chunka Mui, an Index Group managing associate, says companies behave in two ways in tough economic times. Some continue evaluating advanced technology, though with a keener eye towards business payoffs. Others cut or downsize explorations when the going gets tough, he says.

Many companies fall somewhere in between. "The recession has had an impact on Rockwell's appetite to invest in looking at advanced technology," says Bob Scheussler, director of IS technology at Rockwell International Corp. in Seal Beach, Calif. Even so, the aerospace firm continues to look for cost-effective ways to use electronic data interchange, comput-

er-aided software engineering (CASE) and network document exchange, he says.

To help keep abreast of key emerging technologies, U.S. corporations are employing a diverse set of strategies (see company profiles beginning page 68).

- At Texaco, Inc., an advanced technology group sponsors monthly and annual seminars for business units and publishes a newsletter.

- In Atlanta, National Linen Service uses a no-cost, local high-technology center to do much of its up-front research and prototyping.

- USAA employs a formal advanced technology review built right into its corporate structure and is highly supported by top management.

- At Northern Telecom, Inc., a training department developed a sophisticated multimedia system without any involvement from corporate IS.

Regardless of their approach, most organizations are careful to avoid what are seen as the two

Continued on page 67

INSIDE

How four companies do it

Profiles begin on page 68

An alternative to advanced tech groups

Page 73

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Continued from page 65

biggest dangers of developing advanced technology: overemphasizing short-term goals and noodling around technologically while ignoring practical business applications.

"All too often, new technology becomes a solution in search of a problem," says Bob Holmes, a computer technology research analyst at Southern California Gas Co. in Los Angeles. Proceeding that way, he says, "can be a backwards approach to developing cost-effective business systems."

"The most fatal flaw for any [advanced technology group] is to become branded as an ivory tower," Gartner Group's Cafery agrees. "Once that happens, it's a terminal disease."

To avoid irrelevance, most advanced technology group strategies welcome heavy involvement by user departments.

Consultants, however, warn against the dangers of *too much* user involvement, which can lead to runaway costs, duplicated efforts and failure to consider important standards issues.

Striking the delicate balance required can be challenging for IS managers. "It's a little bit like being a farmer," Holmes says. "You plant the crop, water it occasionally and see what grows. It can be a little frustrating, though, to have so little control over what ultimately happens."

Despite such frustrations, U.S. organizations continue to successfully use several approaches to evaluating and developing advanced technology:

• **Creating advanced technology groups.** The most popular tactic is to create an advanced technology group. Without a formal procedure in place to keep an eye on advanced technology, the reasoning goes, the cost of missed opportunity can be much greater than the evalua-

tion process would have been.

Advanced technology groups can typically be grouped into four distinct types, according to Gartner Group (see chart this page). Banking and financial services are most likely to have dedicated advanced technology groups.

Yet another important trend is also emerging: user departments evaluating emerging technologies. "In the past," Index Group's Mui says, "an advanced technology group had a lock on advanced technologies. Now, we're seeing a lot more quasi-advanced technology groups within business units."

For example, a highly skilled graphics department is probably already exploring advanced

timers, people who have had years of implementing projects — anything to ensure we get a fresh outlook," de Silveira says.

• **Fielding advanced technology SWAT teams.** Many companies are already handling technology transfer as quickly as possible. IDS Financial Corp., a Minneapolis-based subsidiary of American Express Co., is a good example.

When the advanced technology group builds a working prototype that interests an IDS business unit, a team is transferred into the user community to perform a pilot test.

"We've found this to be a good mechanism for successful technology transfer," says Bob Procaccini, director of emerging technology research at IDS.

"As soon as a user department has bought into a technology and gives us the go-ahead to build a production system, it then assumes all further development costs," Procaccini explains. "The [research and development] budget is just a way to jump-start the process."

• **Careful piloting.** There is near universal agreement that a carefully planned and controlled pilot project is essential before any technology — new or established — should be implemented corporatewide.

However, consultants say many companies still make the mistake of seeing the pilot as a test of a technology's appropriateness or feasibility — not as a measure of the true costs involved.

"It is *essential* to use the pilot as a costing mechanism," says Paul Berger, president of Consulting, Inc., a Laurenceville, N.J.-based management consulting firm. "See what the actual numbers are, and extrapolate from that."

That's exactly the approach used by The Ultimate Corp., an

Four types of advanced technology groups

Most advanced technology groups fall into one of four categories. Although most groups are a mix, most favor one style

ENDANGERED SPECIES



Scholar

- Almost pure R&D focus
- Few reality checks or implementation worries
- Often seen as "ivory tower" and impractical
- Spends 70% of time on technical issues, 30% on organizational issues
- Approximately 10% of advanced technology groups



Priest

- Tries to explain new technology to the masses, line managers, CEO and CIO
- Attempts to link new technology to strategic and executive issues
- Spends 55% of time on technical issues, 45% on organizational issues
- Approximately 20% of advanced technology groups

FAVORED SPECIES



Navigator

- In between scholar and priest
- Primarily a statesman
- Intermediary between all levels of researchers, end users, managers and corporate executives
- Spends 35% of time on technical issues, 65% on organizational issues
- Approximately 25% of advanced technology groups

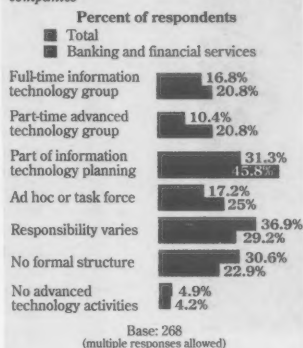


Guerilla

- Works at grass-roots level
- Takes fiercely tactical approach
- "SWAT Team" mentality
- Spends 45% of time on technical issues, 55% on organizational issues
- Approximately 45% of advanced technology groups

Search for tomorrow

Dedicated advanced technology groups are especially popular in banking and financial services companies



Source: Gartner Group, Inc.

CW Chart: Paul Mock

technologies in its specialized field — even if the company has an advanced technology group in IS. Often, IS and the department work closely together.

"In cases where a business unit has done its own research, the role of my group is to try and share [the information] with other business units," Rockwell International's Scheussler explains. "We serve as the arms and legs."

Ironically, growing user appreciation of technology ultimately seems likely to diminish the role of centralized advanced technology groups, Mui says.

• **Rotating employees.** Some organizations rotate IS employees in and out of advanced technology groups to keep outlooks fresh and real world implementation skills sharp. This is the case at Jet Propulsion Laboratory's (JPL) Pasadena Space Flight Operations Center.

Membership in JPL's 15-person advanced technology group is awarded on a "scholarship" basis, according to Carl de Silveira, technical group supervisor. Regular IS employees as well as visiting scholars and technicians right out of school take one-year stints in the group.

"We want to bring in young people as well as academics, old-

East Hanover, N.J.-based reseller of Pick Systems' Pick-based machines. The company wanted to build an expert system to im-

prove telephone technical support provided to customers by 50 employees.

During the pilot, Ultimate carefully tracked all expenses, including training and support. "We were 15% to 18% over our original estimate," says Frank Covey, director of IS at Ultimate. As a result, estimates of the full-scale implementation were revised, and the pilot, now in its testing phase, was a success.

At IDS, the advanced technology group recently finished a rough prototype using a handwriting recognition prototype and has received funding for a more advanced version. Field pilot tests will begin in the fourth quarter. "The purpose of the pilot is to generate numbers," Procaccini explains. "Before we even think about production, we have to have a solid business case, and that includes a thorough cost assessment."

For now, at least, many IS organizations appear to be willing to keep looking toward investing in tomorrow — even if it means a little bit of extra work and expense today. •

Making it work

To more effectively evaluate advanced technology, experienced IS managers and consultants offer the following advice:

• Put a formal procedure in place for investigating promising technologies, making sure senior management supports it both financially and organizationally.

• Keep end users informed of new technologies so they can be thinking of and suggesting possible applications in their business areas.

• Ask vendors to assume part of the risk of building prototypes or of beta testing applications involving new technologies.

• Ask an independent expert, a consultant not affiliated with the corporation or a vendor to assess the feasibility of proposed projects.

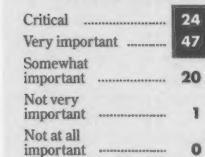
• Before full-scale implementation, perform a carefully controlled pilot test that tracks costs and determines whether the technology works as planned.

Alice Laplante

A must have

More than three-fourths of 1990 Computerworld Premier 100 winners considered advanced technology 'critical' or 'very important'

In your opinion, how important is advanced or leading-edge technology to staying competitive in your industry?



Number of respondents: 92

Source: Survey of CW Premier 100 winners

USAA builds in advanced technology

In 1980, United Services Automobile Association (USAA) outlined its first long-range strategic systems plan. Today, more than a decade later, looking ahead at technology has become a corporate way of life.

Evaluating and implementing

emerging technology is built right into the corporation's organizational structure and is supported at the highest management level, says George McCall, vice president of planning and administration for information systems at the San Antonio-

based insurance firm.

Two years after drafting its strategic systems plan, USAA established a special advanced technology group. Its mission was to track emerging technologies, develop prototypes and notify business units if and when

there was an appropriate match.

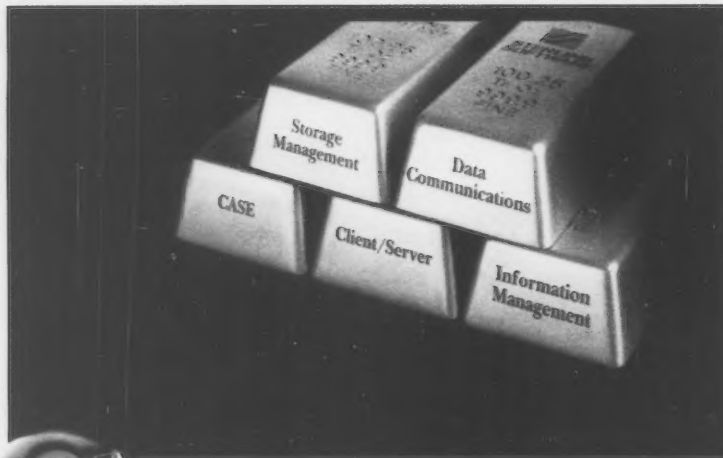
The group's activities are monitored by a research and development review committee board, which consists of presidents of the various USAA companies, including USAA Information Systems, the systems arm

of the company.

"This board decides where they will spend the corporate research dollars and to which line of business those dollars will eventually get charged," McCall says.

For example, in 1988, USAA unveiled an image processing system capping six years of research and prototyping. Although exact cost savings figures are confidential, USAA says the move eliminated 39,000 sq ft of prime office space previously

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TACTICS:
Create R&D review committee board supported by top management, tie R&D to bottom line of business units and require a user sponsor for every advanced tech project.

used to store one year's worth of claims and correspondence documents. Some 160 file managers and delivery clerks were eliminated.

Customer relations and worker productivity also improved, McCall says.

But USAA even goes one step beyond built-in management support: The firm also ties R&D to the bottom line of business units that would be customers of the new technology.

"We have a sponsorship program in which every project has to have a user sponsor who is responsible for signing off on the cost/benefit analysis prior to project implementation," McCall explains. This keeps USAA researchers' feet firmly on the ground, he says. Without a user sponsor, experimentation with technology cannot go past the prototyping stage. •

ALICE LAPLANTE

Back to basics

Albert Smith, executive vice president at Bell Atlantic Systems Integration Corp., recommends that firms evaluating advanced technologies consider some basic questions:

- Will the advanced technology help me meet the goals of my business plan?
- Will the technology change my business plan? Is this beneficial?
- Are the risks associated with this leading-edge technology worth taking?
- Can the advanced technology function within my existing infrastructure?

National Linen lets vendors do legwork

When it came time to get serious about multimedia, National Linen Service in Atlanta decided to take a novel, money-saving approach: Let vendors do the up-front legwork.

A division of National Service Industries, Inc., the firm had looked at multimedia for several years as a better way to train production workers in its 110 U.S. textile plants. The technology, however, was dismissed as immature and expensive.

But last summer, Mark Davison, vice president of strategic systems, decided it was time to launch a serious investigation.



TACTIC:

Minimize research and prototyping costs by using the services of a high-technology center and multimedia vendors.

Why not have potential vendors bear the up-front time and expense of researching and prototyping a multimedia application, he wondered.

So Davison went to Inforum, an Atlanta-based high-technology center that runs a corporate "national briefing service." Davison gave Inforum his firm's technical requirements, and In-

DAVISON TOLD THE two vendor finalists he would like to see prototype systems, developed on their own time and at their own expense. He outlined what he wanted and sent them home.

forum did product and vendor research. Inforum then sent out a request for proposals to 30 vendors, 18 of which replied.

After reviewing proposals, Davison and his staff narrowed the list down to four companies. He sent the short list back to Inforum, which organized and set up technology briefings and provided the demonstration rooms and equipment.

Each vendor then gave Davison and his seven-person task committee a one-hour demonstration, followed by a one-hour question and answer session.

Because Inforum makes its money from participating vendors, which pay a percentage of any contracts signed as a result of the briefings, the energy and financial cost to National Linen was nearly zero.

The company's resourceful-

ness didn't end there, however.

Davison told the two vendor finalists he would like to see prototype systems, developed on their own time and at their own expense. He provided each vendor with National Linen's materials, outlined what he wanted and

sent them home.

How did he sell the idea? "We viewed this as a long-term partnership and asked them to view it this way as well," Davison explains. "We saw it as their job to fully educate us on their products and services and told them

this was the best way to do it."

Davison took both prototypes to National Linen's annual manager's meeting last August, set up a booth that displayed both systems and asked managers from around the country to vote. The winning vendor was then

awarded the contract to build 110 systems.

Davison is currently working with Inforum on another project and says he expects to follow the same process.

"We are a lean and mean data processing shop," he says. "It is essential for us to leverage our in-house resources with services available elsewhere." •

ALICE LAPLANTE

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Lower Costs

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- Training costs are reduced through consistency of software regardless of the underlying platform.
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Protection of Investment

Open systems protect user's investment in information systems, data and training. Industry-wide support for open standards helps guarantee compatibility of existing open products with future ones and compatibility of one vendor's offering with another's.

Faster Time to Market

Open Systems help end-user companies respond to market opportunities more quickly. Open systems lead to the Computer-Integrated Enterprise where information can flow easily between functional groups (e.g., engineering and manufacturing) reducing the time it takes new products to go from idea to reality.

Improved System Integration

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Enhanced Global Operations

Because open standards are international in scope, open systems enable a business to more easily integrate foreign operations with domestic operations. Open systems improve communication and information exchange throughout multinational enterprises.

Portability

The ability to use or migrate, application software, systems software, data and/or people across different computing platforms from multiple vendors.

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Open Systems consist of products and technologies designed and implemented in accordance with vendor-independent standards. In a distributed multi-vendor computing environment, Open Systems enable users to achieve portability of applications, data and people, interoperability and scalability.

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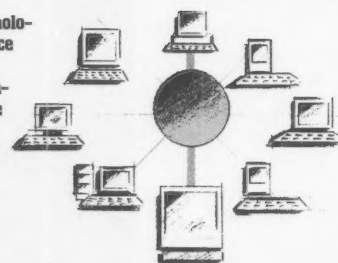
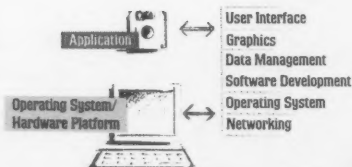
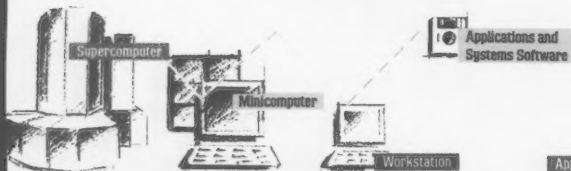
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Quick handoff is Texaco's goal

At Texaco, Inc., the focus is on scouting around for advanced technology and transferring tools into the hands of user departments as quickly as possible.

"We're involved in initial prototyping efforts, but the idea is to get the business unit involved as much as we can and let the users take over at the earliest possible opportunity," says Jeff Lin, a senior systems analyst at Texaco's Advanced Technology Department in Houston.

Although the 30-member group is charged with investigating emerging technologies, its main thrust is on technology transfer, educating end users and

TACTICS: Use a 30-member advanced technology department to expedite technology transfer to business units. Hold seminars and classes and sponsor monthly and annual advanced technology meetings. Publish a newsletter as well in order to keep business units well-informed.



soliciting feedback and suggestions on which projects to pursue.

"We send out surveys within the different business units, asking them what they want to see, what they want to evaluate and basically respond to their requests," says Lin, an artificial intelligence specialist.

Besides spending a major portion of its time on seminars and training classes, the department also sponsors an annual advanced technology conference for end users from Texaco's business units aimed at stimulating ideas and involvement.

Industry figures and vendors are also

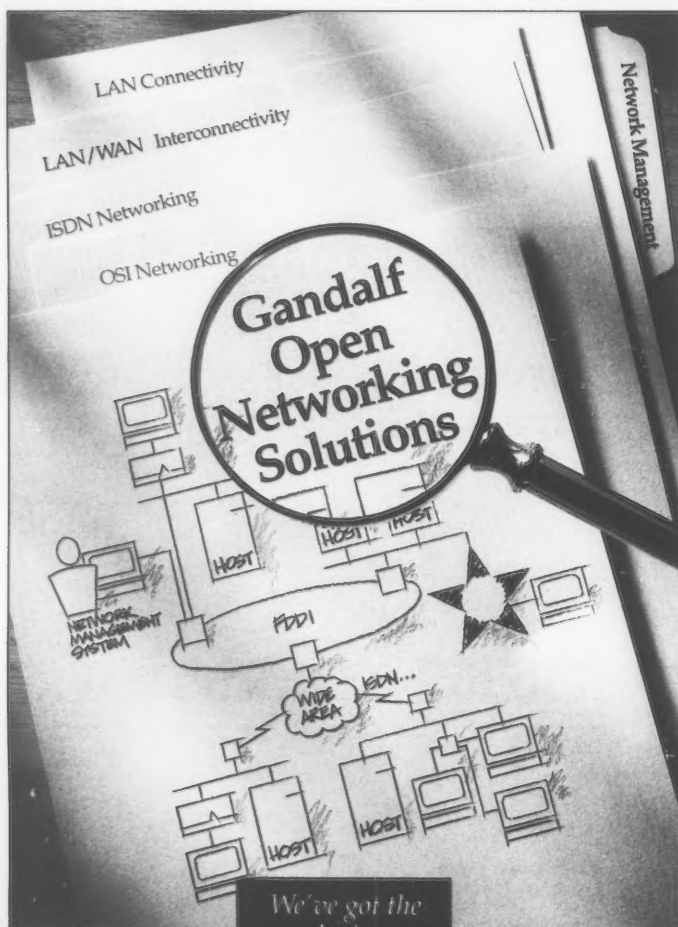
invited to speak at monthly technology meetings. In addition, the department publishes newsletters to get word out to interested end users.

"There is always a strong tendency to try and fit a technology to a problem, instead of the other way around," Lin says. Focusing on transferring technology to user groups helps keep the emphasis on practical applications, he adds.

As one example that the process works, Lin cites the case of a Texaco production engineer who learned about an expert systems tool kit at an advanced technology briefing. Afterwards, the engineer went back to his laboratory and developed a successful drilling diagnostic system using the same tool kit.

The new system, which helps determine the proper drilling tools and methods based on mud at the potential site, has been adopted by Texaco drilling facilities around the globe, Lin says. •

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Users do it their own way

It's a fantasy for many end-user organizations: to embark on an advanced technology initiative with no hindrance from a centralized information systems group.

Northern Telecom, Inc.'s training department decided to live out that dream. The group recently launched an ambitious project to develop state-of-the-art multimedia-based training courses and reference materials incorporating full-motion video, audio, photography and text.

northern telecom

TACTIC: Bypass a busy central IS department by developing a multimedia educational system within the training department.

"Our MIS department is focused on functional projects," says Thor Carden, senior human resources development specialist. "They don't have time for this sort of thing."

"Because we are a technology company... there's a lot of information about a lot of different technologies floating around," he adds. "It's easy, in that you can find people who know a lot about a lot of different things and hard because you have to decide on an individual basis what technology is right for your department."

Carden says he considers the 18-month project a success but acknowledges there can be significant risks in pursuing a decentralized approach to implementing new technology.

Although the group conducted a feasibility study and pilot project, Carden says, many were astonished by the \$20,000 to \$25,000 price tag for each unit.

Another problem is finding ways to share knowledge gained from the project with other departments. "We've made some attempts to broadcast what we've done," Carden says, "but unfortunately, there's no formal way of letting people know. That's one of the drawbacks." •

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Now is the time for a new kind of group

FIRST PERSON

BY JAMES KOBIELUS

Being in an advanced technology group is nice work if you can get it. People in such groups explore technologies most of us know only by name or reputation: artificial intelligence, multimedia, virtual reality, voice and handwriting recognition, parallel programming and neural networking computers, among others.

However, there are several serious problems with many advanced technology groups.

Many advanced technology groups exist to produce a continuing stream of dog and pony shows — demonstrations that illustrate the potential of fancy-pants technologies to match real business requirements. The advanced technology group credo is "demo or die." The reason is that promising demonstrations often become the basis for full-blown pilot projects.

Another fundamental flaw is that advanced technology groups are charged with finding problems (i.e., business applications) to match some predetermined set of solutions (i.e., advanced technologies). When they are staffed by zealous technologists unschooled in the ways of business, advanced technology groups can acquire a "country club" reputation.

Yet another serious problem is that such groups often fixate on new, unproven technologies. They overlook the vast majority of strategic business systems that can be developed by using smart new recombinations of familiar technologies.

What's needed are internal groups that can help companies make the most of technology-enabled business opportunities, regardless of whether they involve state-of-the-art technologies.

One possible moniker for these groups might be "systems opportunities groups." They would differ from advanced technology groups in two fundamental ways:

- **Business-mission orientation.** Systems opportunities groups would focus squarely on strategic, mission-critical business concerns. Specifically, they would seek out opportunities and threats in the company's competitive environment. They would then ask what role, if any, technology-enabled initiatives might play in that regard.

Projects and initiatives would fall into categories defined by corporate strategies: consolidation, standardization, automa-

tion, customer service, reduced time to market, productivity enhancement, etc.

The work might not always involve buying or installing new hardware, software or circuits. Instead, the bulk of the group's efforts would involve innovative

cost containment and quality-control approaches that use existing systems.

- **Ready-made corporate legitimacy.** Systems opportunities group projects would be headed by people with strong corporate credentials. Such indi-

viduals would have the clout needed to push through innovative solutions that may otherwise founder on the shoals of internal politics.

These "trail bosses" would be one part corporate patron and one part team leader on projects.

Their primary purpose would not necessarily be to generate ideas but rather to bring legitimacy to these projects.

If managed correctly, systems opportunities groups could be a focus for ongoing corporate transformation — a place where good, even revolutionary, ideas find the corporate resources and legitimacy they need to get a fighting chance for success. •



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Kobielus is a telecommunications analyst at Fairfax, Va.-based Network Management, Inc., one of the largest local- and wide-area network systems integrators in the U.S.



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COMPUTERWORLD

IN DEPTH

INTERVIEW

Raymond Kurzweil

'What turns me on is to create technology that impacts people's lives'

Raymond Kurzweil turned 43 in February, but there was little time in his schedule for celebration. Kurzweil, a quiet, curly haired computer scientist, must find enough hours in a week to run one company, consult for two others he founded and sold and continue research and development in the pattern rec-

ognition field. If anything, Kurzweil's birthday simply emphasizes how much he has achieved in so short a time.

The son of a conductor and an artist, Kurzweil says he knew by the age of five that he wanted to be a scientist. He wrote his first software program at age 12 and won an award for a database system when he was 13.

At 16, he took first prize from among 65,000 entrants in the International Science Fair with a program that could create original musical works in the style of certain composers. The award helped him get into MIT.

In 1974, Kurzweil started his first company, Kurzweil Computer Products, Inc., and unveiled a prototype for the Reading Machine, an optical scanner that converts print to speech. He sold the firm to Xerox Corp. in 1980.

Two years later, Kurzweil's passion for music and artificial intelligence found an outlet in two companies he started: Kurzweil Music Systems, Inc. and Kurzweil Applied Intelligence, Inc. Kurzweil Music makes the Kurzweil 250, a digital synthesizer. He sold the company last summer to a Korean firm.

At Kurzweil Applied Intelligence, Kurzweil put into practice his vision of the future of computing: voice recognition as a user interface. Kurzweil claims the company holds 75% of the speech recognition market.

Admirers call him a Renaissance man: inventor, philosopher, poet and industrialist. Critics say he's a whiz kid who isn't a whiz at business, since his companies have not been profitable.

Free-lance writer Glenn Rifkin recently spoke with Kurzweil at his office in Waltham, Mass.

Q When you were 13 and thought of your first computer program, did you envision the technology field evolving as it has?

A I'm not really surprised. I've always felt that digital information could encompass many types of phenomena — from sound, speech and music to pictures and three-dimensional objects. Almost everything can be digitized. Even our genetic code can be digitized.

It was also clear to me that a gradual price/performance revolution of digital electronics would ultimately allow all of these types of information to become practical and cost-effective.

Q How do you define artificial intelligence?

A AI is the art of creating machines that perform functions we associate with human intelligence. Intelligence is the ability to use limited resources in an effective way using abstract reasoning, the ability to recog-



Will Crockett/The Kurzweil Foundation

nize patterns and the ability to solve problems in a limited time period.

People most often associate AI with expert systems, which emulate one type of cognitive function, our rational faculties. But probably 80% to 90% of our brains are devoted to pattern recognition and skill acquisition.

Q At what point in AI's evolution are we?

A We are creating systems that can emulate human intelligence within a narrow domain. They diagnose a limited domain of illnesses, play a game like chess, make a type of financial decision, guide a missile toward a building. These systems become idiots again when they go outside their area of expertise.

As AI matures, we're trying to broaden the machine's areas of expertise by combining different AI systems such as speech recognition, natural language understanding and the ability to make decisions within a certain expert domain. This will provide an expert assistant to interact with verbally. But we have a long way to go before we can emulate human functionality.

Q People have grown pretty cynical about AI in the
Continued on page 76

VITAL STATS

- **Personal:** Born Feb. 12, 1948
Married to Sonya R. Kurzweil, Ph.D., a child psychologist in Newton, Mass.
- **Education:** B.S., computer science and literature, MIT (1970)
- **Technology accomplishments:** 1967: Developed expert system for college selection. Sold to Harcourt Brace Jovanovich, Inc. for \$100,000 plus royalties
1976: Principal developer of first print-to-speech reading machine for the blind
1984: Principal developer of first computer music keyboard
1986: Principal developer of first commercially marketed speech recognition technology
- **Selected awards and honors:** 1982: Computer Industry Hall of Fame
1986: The White House Award for Entrepreneurial Excellence
1988: Inventor of the Year (MIT, Boston Museum of Science, Boston Patent Law Association)
1990: Engineer of the Year Award (*Design News*)
- **Hobbies:** Bicycling, hiking and playing the piano

Continued from page 75

past five years. Critics say it hasn't met its potential. What do you think?

A That's unfair, because every time we master a particular area of AI, it ceases to be considered AI. It's just like a magic trick — when you know how it's done, it's no longer magic. Take machine vision, for example, which today is a \$300 million business. People don't consider that AI, but it is part of AI.

People usually just mean expert systems when they refer to AI, but that's just one small part of it. By the end of this decade, most software will be intelligent, but it won't necessarily be called AI.

Q You've started three companies and created several important pieces of technology, yet your companies have not been stunning successes. Other computer entrepreneurs, such as Bill Gates and Scott McNealy, have taken companies to astronomical heights. Why haven't you been able to do the same thing? Is it lack of focus?

A That's apples and oranges. Personal computers are a revolution that has already taken place; it's a multibillion dollar industry. Speech recognition has not yet become as ubiquitous as PCs have.

We don't think speech recognition will replace the keyboard or mouse, but it will take its place alongside those as another major modality of communication between person and machine. It will represent a very large market.

Today, we're leaders in that market. It's just not possible to have built a billion dollar company on speech recognition in 1990, but it will hopefully become possible as the '90s progress.

Q Does that matter to you, running a billion dollar company?

School mixer: Take one part computer science, one part lit

While in college during the late 1960s, Raymond Kurzweil majored in computer science and literature — an odd combination by MIT standards at the time.

Computer science was a new major at the school when Kurzweil was a student there. There were eight or nine courses and only one computer: an IBM 7094 with 32,000 words of 36 bits each and a 2-msec cycle time. The machine was shared by thousands of students and professors.

Because he had taken all of MIT's computer science courses by his sophomore year, Kurzweil turned to literature — specifically, creative writing.

According to Kurzweil, there were only a few students interested in the humanities at MIT then, but because the school was wealthy, it had "an excellent — if somewhat free-wheeling — humanities department." In fact, one of Kurzweil's professors was Lilian Hellman, the American writer,

who taught only one class of seven or eight students per semester.

"We met once a week for several hours in her apartment," he recalls, "and she would give very intense attention to each one of us, critiquing our writing and short stories and segueing into anecdotes of her own life. It was fascinating."

Even with such a role model, Kurzweil says he spent only a few moments of "adolescent passion" thinking about becoming a writer. He felt the pull of technology more strongly.

Although not pursuing writing as a profession, Kurzweil has kept his interest alive in the area of nonfiction. His first book, *The Age of Intelligent Machines*, is a massive tome that took three years to complete.

Kurzweil says the writing process is not that different from creating technology. "You have to build step by step in both processes," he says.

GLENN RIFKIN

Kurzweil companies have the profit blues

While an acknowledged technical whiz, founder fights 'bad businessman' image

Three years ago, *Business Week* featured a less than flattering piece on Raymond Kurzweil's business acumen. The headline read: "This Whiz Kid Isn't Such a Whiz at Business." The gist of the piece was that Kurzweil, while an acknowledged technical genius, has yet to prove his skills in the executive suite.

"He is simply not a businessman," says Harvey Newquist, chief executive officer at Relayer Group, a Phoenix-based AI consulting firm. "His Kurzweil 250 synthesizer was a revolutionary product, but it was priced completely out of whack with the market" at \$10,000, he says. "Kurzweil Applied Intelligence has yet to turn a profit, even though it's one of the oldest voice products on the market."

Such thinking is "off target," Kurzweil insists. "My primary interest is technology, but I've been able to assemble expert management teams, and I work closely with them," he says.

Kurzweil sold his first firm, Kurzweil Computer Products, to Xerox Corp. in 1980 for \$6 million. The Reading Machine, Newquist says, has done little for Xerox's bottom line, although he says it could be as much Xerox's fault as anyone's.

Competing head-to-head with Far East manufacturing companies in the consumer electronics field proved to be too much for Kurzweil Music, which Kurzweil sold to a Korean company. "I

don't think there's been any American company able to compete successfully in that marketplace," he says.

Nonetheless, the company had consistently lost money, and Newquist says he believes it would have gone under if it hadn't been bought.

Kurzweil claims that Kurzweil Applied Intelligence is doing very well from a business perspective. "It has strong support from its investors and has made tremendous progress in growing its revenue," which has gone from \$3 million in 1987 to \$10 million last year. However, it has yet to show a profit.

GLENN RIFKIN



system to provide a narrowly defined intelligent function is very often a perfect match to the narrow deficit of a handicapped person. Computer technology will be a great leveler, dramatically lessening disabilities.

Q What else do you envision when you look toward the future?

A The question is: What is really going to happen when computers can compete with human intelligence or exceed it?

Once a computer can emulate essential human functionality, it can then combine that with the enormous superiority it is already displaying in its ability to remember billions or trillions of facts with extreme precision, to access that information at extremely high speed and to perform functions over and over again very quickly.

If it can read a book, there's nothing to stop it from reading every book that's ever been published and all magazines and technical journals and from mastering all human knowledge. So once it reaches equality with human intelligence in some areas, it is necessarily going to be greatly superior to human intelligence in other areas.

The ramifications of that are difficult to understand. Much of our pride is associated with our confidence in being superior in the intellectual realm.

Q What are the philosophical implications of machines that are more intelligent than people?

A The key is the issue of consciousness and what it means to be a living, conscious entity and whether a machine that appears to emulate humanlike functionality is conscious.

Perhaps the best way to understand the paradoxes this issue confronts us with is to examine the following scenario: Eventually, we'll be able to scan a human being, and a computer will take note of the exact structure of all of our neurons and other cells. You could then imagine creating a new computer that would be wired up in exactly the same way as the person just scanned.

If you ran into this computer, it would seem very much like the original person to you. The question then is, is it the same person? Does this computer have consciousness? One might say yes, because

you'd get all the sense of consciousness if you interviewed it.

The bottom line is: There is no scientific experiment you can conduct to determine whether any other entity — an animal, machine or person — is conscious.

Q What will be the impact of the expanding intelligence of computers?

A It will have a very profound impact on society and the role that human beings play. Despite the fact that computers, automation and machines have increasingly been able to perform functions that human beings can, human employment has increased quite dramatically. We went from 12 million jobs employing 30% of the population 100 years ago to over 120 million jobs employing 50% of the population.

Not only that, the sophistication of the jobs has increased, and they pay six times as much in constant dollars. However, the question remains: What will people do in the year 2050, given the enormous intellectual power computers are likely to have?

Q Is there anything out there you wish you had created?

A There are lots of things I'd have enjoyed doing. Pen-based computing and dynamic handprint systems are very exciting. They will open up computing to a large sector of people who are resisting computers so far.

Q What's next on your technology agenda?

A I'm quite involved with the next generation of speech recognition — the ability to understand very effectively the bulk of English with discrete speech. We are working on a continuous speech recognizer with Fuji Xerox that right now is programmed for Japanese. A person can speak natural Japanese phrases that are multiple words, and the machine will recognize those with accuracy.

Q How would you like to be remembered if it all stopped tomorrow?

A That I created technologies that had a positive impact on people's lives. •

COMPUTER INDUSTRY

NATIONAL BRIEFS

Knocking our socks off

► The Patent and Trademark Office of the U.S. Department of Commerce has released its Top 10 list of the firms winning the most U.S. patents during 1990. They are: Hitachi Data Systems Corp. (908 patents), Toshiba Corp. (891), Canon Kubushiki (868), Mitsubishi Denki (862), General Electric Co. (785), Fuji Photo (767), Eastman Kodak Co. (720), Philips Corp. (637), IBM (608) and Siemens AG (506).

And the winner is...

► ... Stanford University, whose team of computer programming students emerged victorious in what sponsor AT&T Computer Systems described as "a five-hour battle of logic, strategy and mental endurance." The finals of the 15th annual ACM Scholastic Programming Contest pitted 25 teams from universities in the U.S., Europe, Canada and the Pacific Rim against each other in trials testing their ability to create programming answers to real-life dilemmas such as routing fire trucks around closed streets. The Netherlands' Vrije University took second honors.

Poised for debut

► Siemens Nixdorf Printing Systems, a high-performance, low-impact printer joint venture between Burlington, Mass.-based Siemens Nixdorf Information Systems and Louisville, Colo.-based Storage Technology Corp., has its headquarters site pinned down and its management lineup in place. Chief Executive Officer H. Werner Krause announced earlier this month. Some 80% of the new firm's approximately 500 employees will be located at a Boca Raton, Fla., headquarters, Krause said.

Tighter bonding

► After two years as joint marketers, Newton, Mass.-based Marcam Corp. is about to acquire Toronto-based Shawware, Inc. Marcam makes IBM Application System/400-based process manufacturing software. Its Canadian ally-turning-acquiree is a privately owned supplier of maintenance and materials management software for the AS/400. The deal will be a stock-swap, according to Marcam.

Public offering pace picks up

BY NELL MARGOLIS
CW STAFF

Last fall, a market research firm that tracks technology firm initial public offerings (IPO) ran into a wall: With tech stocks battered and the national economy bleeding, said Richard A. Shaffer, head of New York-based Technologic Partners, "We debated skipping the 1991 edition of our survey of the tech firms most likely to go public." So few seemed likely to take the plunge, he said, there was a serious question as to whether the list would be long enough to merit publishing.

Last week the wall lay in shards, stamped by a herd of public-bound computer companies almost 100% larger than last year's contingent, Shaffer said.

Really? No, rally. Some Wall Street watchers are even beginning to talk in terms of a rerun of the Big One of 1982-1983, said John Rohal, an analyst at Alex. Brown & Sons, Inc. in Baltimore. "The elements seem to be lining up: reasonably low interest rates, low inflation, reasonably slow growth that encourages investors to invest without making them feel like they'd be fools to

invest in something as risky as technology." In addition, he noted an absence of other investment themes, such as the mid-1980s leveraged buyout frenzy, that might serve to distract potential tech investors.

Also auguring well for a boom in technology issues is the solid performance logged by firms such as Microsoft Corp., Sun Microsystems, Inc. and Novell, Inc. during the recent hard times — an endurance record that has not escaped the notice of investors, Rohal said.

However, analysts agreed, even while the prevailing market conditions eerily evoke those that ushered in the now-legendary 1982-1983 rally, no such event is guaranteed.

"Yes, there is definitely a window," Paine Webber, Inc. analyst Robert Therrien said. What might close it? "A realistic appraisal of how tech companies are performing," he speculated. "Every year going in, Wall Street overestimates the capacity of tech companies. Every year, when its unrealistic expectations aren't met, Wall Street retaliates."

In fact, Shaffer noted, last year also started with a flurry of strong IPO predictions, "only to

see the IPO market killed in the second half by recession fears and the prospect of war in the desert." The Federal Trade Commission's current investigation into business practices at Microsoft, which tripped the firm's stock last week, is the kind of event that could ruffle newfound investor confidence in technology stocks.

However, Shaffer said, the one predictable thing about the

market — particularly the volatile technology sector — is its unpredictability, and at the moment, 30 to 40 firms appear raring to go public. As was the case last year, he said, networking and software look to be the technological hooks most likely to spear investor dollars.

What profile is least likely to attract capital? "If it takes more than a single sentence to describe what your firm does," Shaffer said, "you're in a poor position. Investors are easily bored, and they've got plenty of places to park their money."



TOP SIX PICKS

Good bets to go public in 1991

- ▼ **Chipcom Corp.** (Waltham, Mass.): makes so-called "smart communications hubs" that reduce cabling needs in local-area networks
- ▼ **Intuit** (Menlo Park, Calif.): designs financial software for homes and small businesses
- ▼ **Network Computing Devices, Inc.** (Mountain View, Calif.): X Window System display station vendor
- ▼ **Sybase, Inc.** (Emeryville, Calif.): makes high-performance on-line relational databases
- ▼ **Synopsis, Inc.** (Mountain View, Calif.): provides logic synthesis for design automation
- ▼ **Wellfleet Communications, Inc.** (Bedford, Mass.): designs systems that interconnect similar and disparate networks

Source: Technologic Partners

CW Chart: Tom Monahan

Preferred takes the leap into network maelstrom

BY JIM NASH
CW STAFF

WILTON, Conn. — Taking the high dive into a dark pool is crazy. So is stepping from a relatively concrete and nontechnical industry into the slippery maw of personal computer-based networking.

For Preferred Systems, Inc., a newborn in the highly competitive and potentially bruising networking market, the risk appears to be worth it, if for no other reason than the experience gained, according to its founder. Preferred Systems is the high-tech spin-off of Preferred Health Care, Inc. (PHC). PHC is a public firm that manages mental health benefits (see story page 81).

Last year, PHC decided to move its client and service provider databases off its IBM Application System/400 and onto a

Novell, Inc. local-area network. In the process of downsizing its databases, the company learned what many before it had learned, said Jack Serfass, PC and communications network manager: Configuring a large network is a project that requires healthy doses of stamina and nerve.

It was at that time that Serfass started looking for ways to automate the configuration process. He wanted to abbreviate the weeks-long task of assigning access and peripherals rights to users on each file server. That same process must be duplicated on each server, and mistakes often wait to show up after the network is already run-

ning, he said.

Unable to find software that could simplify configuration, Serfass and his staff remained determined to shrink the time and complexity of configuring servers. They began developing the software in-house. The team came up with two applications: one for configuring new networks and one for reconfiguring existing networks.

Last March, the man in charge of PHC's migration project, Executive Vice President Steve

White, casually asked what "bright ideas"

Serfass had. Serfass told him about automating server configuration.

"At first I didn't understand the significance of that," White said. "It didn't sound that radical to me. When I finally grasped what they had done, it stimulated my thinking."

White, who left PHC last July to become vice president of Charter Medical Corp. in Macon,

Ga., said that although Serfass' team had built the software, the company still knew little about the market for such a product.

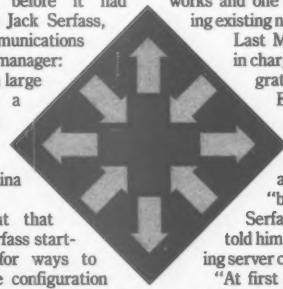
"The more we researched the industry," he said, "the more we discovered that no one else knew very much either. That is a key element to embarking on a risky business. It's what tells you that you have virgin territory."

Scott Stein, an analyst at Technology Investment Strategies Corp. in Framingham, Mass., took a look at the finished goods and said he believed that what he saw would be a unique entry in the PC applications market.

"I went in early one morning," White recalled. "I said, 'Jack, I'll bet that if the company were to create a business structure, you could benefit from that software.' That weekend, we sat in my home in Connecticut developing a business plan."

Although the idea did not meet instant and unanimous approval from others in the company, Paul Litwak, executive vice

Continued on page 81



Two firms criticize IBM Norway's leasing policy

BY DON RADOLI
SPECIAL TO CW

OSLO — Two leading Norwegian computer leasing companies have accused IBM Norway of luring customers into seemingly competitive leasing agreements. The companies claimed that after IBM has obtained an agreement, it charges the customer exorbitant prices both for upgrades and new equipment.

Rolf Sandanger, president of Norway's CMA-Computer, has charged IBM with deliberately enticing customers into these contracts in order to influence their future equipment procurement policies.

IBM's assessment of the residual value of its equipment after the contract expires is extremely high, he said.

A customer can reportedly purchase an Application System/400 from a third-party leasing company at half the price IBM charges for the same machine. Upgrades are also extremely expensive compared with what the customer pays for the same equipment on the open leasing market, according to both companies.

"If a customer has an AS/400 Model 35 or 45 and wishes to upgrade to Model B50 or 70, he can get the upgrades from leasing companies at prices that are sometimes 60% lower than what IBM

charges," Sandanger said.

Paul Johannesson, president of Norwegian leasing firm Cominvest, said it is important for the customer to be aware of what might happen should he terminate the contract.

Staying mum

None of IBM's leasing customers wished to comment publicly on their leasing agreements with IBM, and IBM Norway's managers were not available for comment.

Meanwhile, in stark contrast with U.S.-based parent IBM, which posted a healthy pretax profit of \$6 billion last

year, IBM's Norwegian subsidiary recently recorded a pretax profit of only \$6.8 million — a 67% decline from 1989, when the subsidiary earned \$20.6 million. Total revenue rose slightly from \$400 million in 1989 to \$416 million in 1990.

IBM Norway President Roar Hoel said the dive in net income for last year was caused by expenditures totaling \$48.3 million on equipment for leasing as well as the company's early retirement program. Fifty employees left the company last year under the early retirement scheme. Exports from Norwegian industry to IBM's production facilities rose 36% to just over \$33.3 million.

Radoli writes for Computerworld Norway, an IDG Communications Norwegian publication.

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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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INTERNATIONAL BRIEFS

By any other name?

► Dutch technology firm Philips Telecommunications N.V. is in the midst of restructuring not only its operations but also its name. According to a recent report in the financial press, the firm — still predicting a 1990 net loss in the ballpark of \$2.33 billion — will emerge as Philips Electronics N.V. The current Philips board and management will remain in place after the reorganization.

Czech DEC

► Digital Equipment Corp. took its Central and Eastern European expansion campaign a step further with an announcement early this month that a DEC subsidiary will open in Prague this June. With a 1-year-old Hungarian joint venture kicking in "results that have far exceeded our expectations," said Alberto Fresco, vice president and country group manager at Digital Europe, "we believe the same will be true in the Czechoslovakian market."

With help from le Grand Bleu

► Paris-based *Advisers S.A.*, supplier of decision support systems to corporate data centers throughout Europe, is taking its line to the U.S. through a subsidiary recently established in New York. According to John Z. Dorn, the subsidiary's president, *Advisers' European success has been achieved partly through its long-term status as an IBM France marketing partner.* "We expect to duplicate the phenomenon for corporate America," Dorn said.

Gainer

► Munich, Germany-based *Computer 2000 AG* is bent on becoming Europe's largest peripherals and software distribution company serving the IBM Personal Computer and compatibles market by 1992, founder and Chairman Jochen Tschunke said in November. The firm's 1990 earnings, announced earlier this month, suggest that the goal is not entirely unrealistic. Taking into account several acquisitions made within the year, *Computer 2000* posted revenue up 130% to \$400 million. The firm is now realizing more than 40% of its revenue from sources outside Germany, according to the report.

German Railways: May the best firm win

BY HEINRICH VASKE
IDG NEWS SERVICE

FRANKFURT — Major computer companies are currently courting German Railways, and with understandable eagerness: Whichever firm wins will participate in building a Europe-wide cooperative transportation management system.

A panel discussion organized by German Railways' transportation management recently revealed just how different the manufacturers' data processing approaches are when solving extensive logistical railway problems.

Looming large among the panel's questions were: Can the railways, including those in the former East Germany, integrate their heterogeneous hardware and software systems environments in the future? And how can a European and worldwide information technology application be created while also taking into account other means of transportation?

IBM Deutschland supports an all-encompassing German railway architecture and standardized framework based on its corporate parent's Systems Application Architecture, according to IBM spokesman Edmund Hug. However, "the whole thing has to take place in a heterogeneous environment of different suppliers of hardware, software and services," Hug said.

There will no longer be a single data processing manufacturer that makes all decisions for a company such as German Railways. Unix will play an important role in unifying the different architectures. However, the decisive factor will be to standardize workstations.

Goetz H. Siebrecht, managing director at Unisys Deutschland GmbH, supported open systems over proprietary software. He said there is a trend in Germany that the railways should follow and cited Unix as the central point. He claimed that for the first time, Unix allows user independence of hardware and, therefore, guarantees investments. Moreover, it renders

an inexpensive software palette because most of today's applications are developed for Unix systems.

Peter Hess, project director of logistics consulting at Tandem Computers Deutschland GmbH, launched the discussion on Unix vs. proprietary software. He said Unix is not suitable for developing logistical architecture. One disadvantage, for example, is that the initial program load always has to take place on site. In addition, there are no polished management components, and Unix is not a transaction-oriented operating system.

Peter Page, a member of the board of

directors at Germany's Software AG, and Joerg Rieder, Digital Equipment Corp. GmbH's managing director, also spoke in favor of open systems. Page stressed open cooperation among different partners, which should be encouraged by the railways. He proposed that the German Railways turn away from a "general enterprise in classical style" and concentrate on different suppliers to reach a common solution.

A "general staff plan" would make sense for the railways' data processing partners as an orientation aid for its business partners. Rieder said he considers

this one of the most important tasks for German Railways in the future. He said the motto must be "strategy before organization and organization before technology." Technology is already available to integrate an information system for road and air traffic, railways and waterways. Otto H. Grueneberg, a member of Siemens-Nixdorf Informationssysteme's board of directors, outlined an example for such a solution, independent of transport means: The Canadian postal authority is currently using a system that guarantees delivery within four days. Each transport segment, from railways to airlines to trucks, is completely controlled.

Vaske writes for Computerwoche, an IDG Communications German publication.

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EXECUTIVE BRIEFS

Arvin named to Meridian post



Mark A. Arvin has been named to the newly created position of executive vice president and chief financial officer at Meridian Technology Leasing Services.

Arvin formerly served as vice president and CFO at the Deerfield, Ill., computer lessor, which posted revenue of nearly \$586 million last year.

McLean, Va.-based Corporation for Open Systems (COS) announced earlier this month that its president and chief executive officer, Lincoln D. Faurer, is retiring.

He will be replaced by COS' chief operating officer, Steve Hudson, pending approval by the board of directors in May.

Faurer is a retired lieutenant general in the U.S. Air Force and a former director of the National Security Agency.

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Volunteer group offers IS benefits

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — A volunteer group based here has put the art of giving into the age of computing. At Non-Profit Computing, Inc. (NPC), the spirit of giving lasts all year. The volunteer group helps nonprofit organizations enter the age of computing by giving advice about what gear to buy and providing custom programming services.

NPC, which has affiliate groups all over the world, is made up of "PC gurus" who run the gamut from information systems staff members at large corporations to independent consultants and people who just like to play around with computers.

Among the more recent NPC clients is the St. Aloysius Education Clinic. The clinic's 20 Panasonic Co. and Apple Computer, Inc. personal computers are used by some 650 students in

kindergarten through sixth grade.

The clinic serves children from two schools in New York's Harlem neighborhood, where the computers help teach reading and writing. A math program recently got under way as well.

"The computers are so motivational to our children," said Beth Pettit, a teacher at Public School 92 and director of the education clinic. "We even have them in special education classes."

A joint effort

NPC worked with other organizations to help the clinic get its PCs from a New York university that was upgrading its systems. "NPC helped us design the systems, gives us technical assistance and fixes them when we have problems," Pettit said. "They've got a great bunch of people; we're very grateful to them." She added that the clinic

is seeking additional PCs to expand its programs.

Ben Stock, an NPC member who also volunteers at the St. Aloysius after-school program that helps children with their homework, said NPC sometimes has problems finding homes for the computers it receives. "Most of [the equipment] is really old," he said. "We get Displaywriters and original CP/M machines and IBM PCs."

So, more often than arranging for the computers themselves, NPC members are called on for advice. The group runs monthly workshops and arranges for one-on-one assistance at the user organization's shop. NPC is currently providing Displaywrite training to New York's Spanish

Repertory Theatre, for example. All of NPC's services are provided free of charge; there is no paid staff.

NPC was founded in 1984 as a special interest group of the New York Personal Computer Users' Group. "I started thinking that a lot of people needed help but couldn't afford consultants and didn't know where to turn," said John German, who co-founded NPC with current volunteer coordinator Joanne H. Malbin and is still very active in the organization.

"And I knew from the users' group that there were people in the PC community who volunteered their time and effort, only not with activities to do with computers," German said. "Here we had a lot of people with the skills, and organizations that needed them. So I started trying to make a match."

Events were helped further when industry analyst Esther Dyson "donated the contents of her office," German said. German and Malbin got on the telephone and found groups that needed the software; the NPC was born.

In fact, NPC is affiliated with 17 groups worldwide that help nonprofit organizations. These groups are located in Berkeley, Calif., Houston and Middletown, Conn., as well as in Toronto, London and Berlin, Germany. NPC recently published a guide to groups that provide services similar to its own and is trying to formalize relationships with these other groups so they can direct potential donors to groups located closer to the donor.

Like many organizations, the number of NPC volunteers fluctuates wildly through the year. It ranges from a core group of maybe 20 to a high of 100 or more who give anywhere from two hours per year to 10 or more hours per week, NPC members said.



Nonprofit body allows options for disabled

BY SALLY CUSACK
CW STAFF

PELHAM, N.Y. — In 1970, Cristina McMahan was born with cerebral palsy.

In 1981, D. Bruce McMahan donated a personal computer to his daughter's special education class at Yonkers Public School in New York, and the National Cristina Foundation (NCF) was unofficially born.

The NCF, a nonprofit organization officially founded in 1985, solicits obsolete computers and related technology from businesses throughout the world to assist people with special needs in achieving goals and reaching their full potential.

According to Yvette Marrin, president and co-founder of NCF, the organization has distributed, at no cost, in excess of

5,000 PCs and peripheral equipment to help train people with differing abilities.

Marrin is a music box of uplifting anecdotes, each one telling how technology helped a child succeed: a proud little girl given the means to make her father a birthday card, the wheelchair-bound boy playing his very first game of basketball, albeit electronically, and the list goes on.

Ten years after the original PC was donated in Yonkers, Marrin can point to a list of projects the NCF has successfully completed with the aid of computer companies that have been willing to dig into their store-

rooms for contributions.

The unique value of technology to her students began to dawn on Marrin just as the concept of desktop computing was beginning to define itself in the marketplace, she recalled. "PC technology was young, and you couldn't just pick up a phone and place an order. We weren't exactly sure how to start."

Marrin did realize, however, that students with cerebral palsy, spina bifida and other conditions that restrict upper body movements had a difficult time with traditional pen-and-paper techniques. Seeing that an electric typewriter improved the situation to a small degree, Marrin said she felt a PC could offer even more toward helping her pupils gain learning independence.

Expert help

Together with a biomedical engineer and an occupational therapist, Marrin explored ways to help the computer meet diverse individual needs. Progress was slow, considering that user groups were scarce back then, and none catered to educators interested in assistive technology, she said.

In Cristina McMahan's case, writing was an especially tiresome situation. Beyond a few sentences, writing is an absolute chore for many such students, Marrin said. Therefore, one of the first software applications brought in was a word processing program.

In addition to writing, the class soon learned that technology was helpful in a dozen differ-

ent ways. The PC aided in independent reinforcement and drill practices, assisted children with math problems and allowed them to play games. According to Marrin, the system gave them a sense of empowerment.

"The PC allows children with differing abilities to take control and operate independently and permits them to master skills without intervention," she said, adding that the PC is also a "patient and nonjudgmental teacher, wonderful for reinforcement and practice exercises."

Outdated PC equipment

Citing a report from Dataquest, Inc., a market research firm in San Jose, Calif., Marrin noted that almost 30 million PCs will

be obsolete by 1994. The U.S. Department of Labor predicts that by the year 2000, some 25 million jobs will be created that require a knowledge of computer technology.

By soliciting outdated equipment for training and educational purposes, NCF tries to help bridge a wide gap by creating a skilled work force. Expanding beyond the classroom, the organization has placed industry-donated PCs in job training facilities, hospitals, vocational and rehabilitation centers and correctional institutions, Marrin said.

The NCF now serves almost 40,000 people in 400 locations in 30 states and five countries, according to Marrin.



Helping hands

The following are among the computer industry companies that are helping the National Cristina Foundation in its efforts, according to President and co-founder Yvette Marrin:

- Apple Computer, Inc.'s Office of Special Education and Rehabilitation in Cupertino, Calif. Apple maintains a database of hardware, software and publications related to adaptive technology.

- The IBM National Support Center for Persons with Disabilities in Atlanta. Established to educate people about how adaptive technologies are applied to aid persons with disabilities, the center maintains a database of approximately 850 products related to assistive technology. It also has staff members available to answer questions or to mail specific information.

- The Trace Research and Development Center in Madison, Wis. In addition to developing adaptive technologies, the organization has worked closely with Apple, IBM and other computer manufacturers in an effort to make computer systems more accessible to those with differing abilities. The center also offers a comprehensive database of adaptive technology products.

SALLY CUSACK

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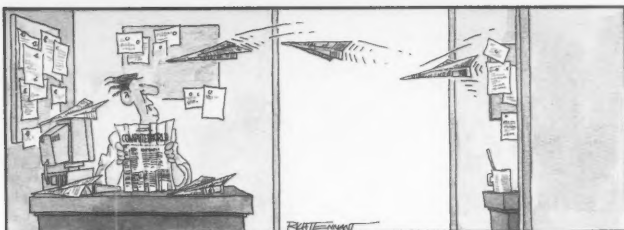
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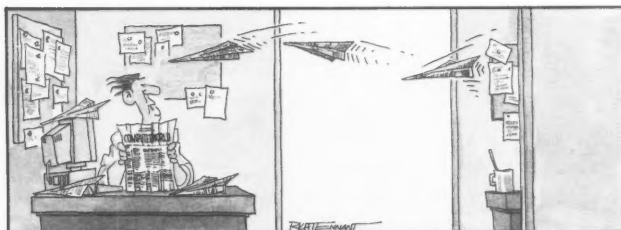
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- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Distr./Retailer
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- 85. Vendor - Other _____

(Please specify)

2. TITLE/FUNCTION (Circle one)

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- Network Sys. Mgt., Dir./Mgr. PC Resources
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Mgrs., Suprv. of Programming, Software Dev.
- 32. Programmers, Software Developers
- 60. Sys. Integrators/VARs/Consulting Mgt.
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- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 51. Sales & Mktg. Management
- OTHER PROFESSIONALS**
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- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Local Area Networks
- F. No Computer Involvement

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- 20. Finance/Insurance/Real Estate
- 30. Medicine/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
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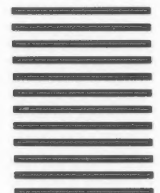
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COMMENTARY

Nell Margolis

Multiple-choice predictions



The computer leasing industry is a vibrantly healthy sector showing expected 1991 growth in the 15% ballpark.

The computer leasing industry is an embattled former boomtown that will be fortunate to see 1991 growth in the 6% ballpark.

Which of the above statements — the former, courtesy of Gartner Group, Inc.; the latter brought to us by Technology Investment Strategies Corp. — is true?

If the answer isn't "both," we're in trouble because each is the conclusion of a recent survey by one of the few reputable market research firms attempting to bring some statistical certainty to computer leasing — an industry sector that has often eluded definition, never mind quantification. When it comes to computer leasing, if you can't trust Gartner or

TISC, whom can you trust?

Want to have it both ways? Here's how: Trust Gartner. Trust Technology Investment Strategies. Don't trust statistical certainty.

According to the 1990 Survey of the U.S. Computer Dealer and Lessor Industry coproduced by Gartner Group and the Computer Dealers and Lessors Association (CDLA), whose membership is estimated to cover 80% of the third-party industry, that industry logged 7.5% actual growth in 1989 (in contrast with 15% estimated by Gartner) and was projected at 19% growth in 1990, which had yet to close when the survey was done last fall.

Gartner did hedge a bit, noting that continued economic woes and negative trends particular to the leasing sector could drive 1990 and 1991 growth into the 10% to 15% neighborhood.

The Gartner report was issued in mid-January. That gave us about six weeks to be glad before Technology Investment Strategies, Gartner's archrival, clocked in with alternative stats.

According to TISC, even Gartner's 10% to 15% neighborhood turned out to be a high-rent district for the third-party leasing industry, which moved into the 3.6% or 4.6% growth area (depending on whether you look at profits or volume) in 1990.

TISC projected a slightly rosier 5.4% profit growth and 5.5% volume growth for 1991; however, TISC President Charles Greco added his bet that a win by IBM Credit Corp. (ICC) in its current lawsuits within the industry [CW, March 11] could depress the third-party market "into a negative growth situation by the end of 1992."

WANT TO HAVE IT both ways? Here's how: Trust Gartner. Trust Technology Investment Strategies. Don't trust statistical certainty.

Imagine a user — a banker trying to decide whether to finance leases this year, for instance, or an IS director trying to decide whether the lessor who seems to be offering a good deal is going to survive to honor its tempting terms — attempting to get some guidance from the industry's two premier surveys. This image will certainly linger in my mind the next time someone tells me how easy it is becoming for users to seek shelter

from the apparent chaos and contradictions of the third-party leasing industry in the apparently safe arms of ICC.

However, imagine this: The user simply skips the statistical summary and focuses on the rest of each report. Suddenly, it looks like Gartner and TISC are actually talking about the same industry. In fact, the growth numbers are about the only glaring disparity.

Drop them, and what you get from both reports is the profile of an industry with a widely diverse makeup, in a largely reactive (to ICC) state, amid a wrenching — but in some instances successful — attempt to diversify their leasing portfolios, affected by the same macroeconomic conditions that apply to U.S. industry and generally optimistic in nature.

This profile might drive you away from doing business in or with this sector. It might entice you. It might inspire you to seek more information. What it won't do is give you the potentially dangerous illusion of statistical certainty.

How fast is the third-party leasing industry growing? After reading the computer industry's best-pedigreed surveys, who knows? And as long as you know that, who cares?

Margolis is *Computerworld's* senior editor, industry.

Preferred

CONTINUED FROM PAGE 77

president at PHC, saw one black-and-white advantage. "It's hard to make money in the service business, if you want to provide good services at good prices," Litwak said. "I saw this [tangible marketable product] as a good way to get back some margin."

REVIEWS OF THE two Novell-compatible products before and since the show have been strikingly encouraging.

White and Litwak spotted an additional business advantage. "Sure, it was outside of health care and workers' compensation, but this wasn't a start-up," White explained. "We had already pulled it off. We already had a product."

Last April, Preferred Systems was incorporated.

"The worst that can happen is we will lose the money we put into [Preferred], get out and lick our wounds," Litwak said.

He admitted to some minor mental flutters. "Going home the night we made the decision, I told myself, 'You've got a lot of nerve to do this,'" he said. "But we are pretty sensible people. We're able to do this as anybody is."

In fact, White said, the founders believe that Preferred is better able to do it because the company was, in effect, its own alpha-test site.

"My first temptation is to say I've been involved in other projects like this, but this one is unique," White said. "It will accelerate the acceptance of networking technology... by taking the scariest out of going to a network."

Rave reviews

In February, Preferred and its two applications, Origen and Lanstandard, held a coming-out party at Network in Boston. Reviews of the two Novell-compatible products before and since the show have been strikingly encouraging.

"Origen is great for network managers," said Matt Ventura, systems administrator at the University of Rhode Island

Family ties

If spinning off high-teching Preferred Systems, Inc. was a little easier for executives of Preferred Health Care, Inc. (PHC), it might have been by benefit of PHC's own entrepreneurial background.

Wilton, Conn.-based PHC is a 6-year-old spin-off from Four Winds, Inc., a Katonah, N.Y.-based hospital company. A group of clinical mental health professionals from Four Winds saw that mental health benefit claims often were either underpaid or overpaid.

Steve White, PHC's former executive vice president, said the group realized that by scrupulously detailing mental health benefit cases on computer databases, they could allocate benefits more fairly and consistently.

Since then, PHC has become one of the fastest growing small companies in the U.S. The company showed 47% growth in profits in 1989, tallying \$14.6 million in sales, according to *Businessweek*. That may pale in comparison to some volatile high-tech companies, but for an insurance management firm, it has drawn attention.

JIM NASH

in Kingston, R.I. Ventura has overseen a beta test of the product in his 200-user computer lab. He said he has used Origen to shorten to a matter of hours the configuration time for his student users.

Analysts who have seen the products said that even if Preferred's automation

software is the only product it produces, the company will probably succeed as a business.

"I think they have a real thing here," Stein said. The products are based on reality. [They grew out of] the company's own concerns."

Advanced tech awards granted

The U.S. Commerce Department has awarded the first research grants under its Advanced Technology Program, which is intended to assist U.S. companies working on advanced technology.

The grants, which amounted to \$9 million, will be given to companies developing such technology as flat-panel displays, X-ray lithography and wiring-board interconnect systems.

The federal government is expected to hand out additional grants during the fiscal year. Congress authorized about \$36 million for the program this year and a similar amount for the following year.

The program is aimed at fostering

emerging technologies with significant economic benefit, according to the Commerce Department. The Microelectronics and Computer Technology Corp. (MCC), for example, received an award to support research that will be used to commercialize what MCC called a Photorefractive Volume Holographic Storage subsystem.

MCC researchers have found a way to store pages of information as images in a photorefractive crystal material array called strontium barium niobate. The images can be retrieved 100 to 1,000 times faster than from a disk drive, MCC said.

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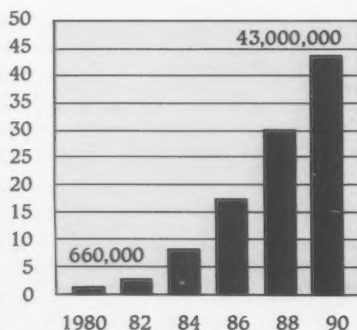
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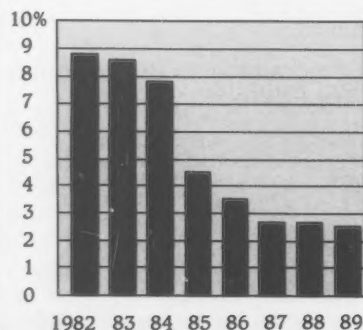
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COMPUTER CAREERS

Room for IS creativity in mail-order firms

If you don't mind working late during holiday seasons, a catalog company may be the place for you

BY SHERYL KAY
SPECIAL TO CW

During times of high unemployment, information systems professionals may find success by seeking jobs in companies that occupy the nooks and crannies of U.S. business. One area in which demand for IS programmers and analysts is increasing significantly is the mail-order industry.

With increased competition for the limited shopping time of today's consumers, mail-order companies are relying more heavily on IS to create innovative marketing and inventory applications. Fortunately for IS professionals, many mail-order firms are willing to pay big bucks for the right talent.

The downside of IS positions in mail-order companies is that professionals are asked to wear many hats, and they must work under high pressure during busy seasons such as Christmas.

In addition, mail-order IS professionals must be ready to consider relocating in order to change jobs because mail-order companies are scattered in locations throughout the U.S.

IS professionals in the greatest demand among mail-order companies are those with a combination of business and technical skills, such as systems analysts and managers.

In fact, mail-order companies will often pay up to 10% above national averages for those kinds of professionals, according to Jim Bond, placement manager at Robert Half International, Inc. in Hartford, Conn.

Strong business skills

Spiro Papanatontos, director of systems and programming and a 31-year veteran at Spiegel, Inc. in Oakbrook, Ill., says he finds that because IS is such an integral part of Spiegel, the people he hires must have strong business skills along with the usual technical background.

This sort of background can pay off in the long run. Former IS employees often become business systems liaisons, working as go-betweens for the IS and user community, according to Papanatontos.

One key area of systems development in mail-order companies is marketing, says Winnie Tuszynski, vice president of IS at Dick Blick Co., an art supply cat-

alog firm based in Galesburg, Ill. To help a company expand its mailing base, IS professionals analyze, massage and manipulate demographics and other assorted customer information that has been collected.

"Our company depends heavily on our programming staff and what information we supply to our other departments," Tuszynski says.

Another significant applications development area is inventory control. "We are always looking for ways to buy better and to ship quicker," Tuszynski points out — so once again, a large part of the company's success relies on IS.

One of the attractions of working in a mail-order firm is that the applications are unique.

"Many of these marketing and inventory systems are very esoteric — not as structured as your standard accounting systems — so they can be more difficult and a challenge to IS professionals," says Paul Pecorin, vice president and chief information officer at Lillian Vernon Corp. in Mount Vernon, N.Y.

Experience not required

Interestingly, recruiters and IS hiring managers in the mail-order business say previous mail-order experience is not required for new hires in IS, even though

the implemented systems are unique and extremely tricky to develop.

"It may be slightly easier for

der. "We all wear many hats, so if you're used to working on only one project, you will be frustrated with a catalog company," Pecorin says.

Mail-order business volume is also subject to peak seasons, particularly from October through December. Pressure is put on the IS department to offer superior

MAIL-ORDER COMPANIES are relying more heavily on IS to create innovative marketing and inventory applications. Fortunately for IS professionals, many mail-order firms are willing to pay big bucks for the right talent.

others coming from another mail-order or retail company," Papanatontos says, "but they still won't have the full knowledge of how we function." Each mail-order company is different in its size, terminology and business requirements, so even programmers with mail-order experience will need training at a new firm.

Technologies that are the hottest in mail-order IS fall into the midrange category: Professionals would do well to have a background in IBM's System/36, 38 and Application System/400 because those are the systems most often used at mail-order companies, Bond says.

However, IS professionals coming from other industries in which the IS departments are more structured may not be comfortable with a career in mail-order

customer service at a reasonable cost by fine-tuning and monitoring systems in order to keep response time to a minimum.

"There can be long hours, so people must be more flexible and do more on their own," Papanatontos says.

Those who can handle the pressure and the lack of structure at mail-order companies should consider the relocation issue.

"Should an IS professional wish to stay in the mail-order line of business, they've got to be open to moving, as there is no mail-order capital of the U.S.," Bond says.

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.



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A tale of two Missouri cities

IS employment opportunities spry in the west, dry in the east

BY JILL VITIELLO
SPECIAL TO CW

Although St. Louis and Kansas City are located on opposite sides of Missouri, they might as well be on opposite ends of the planet as far as information systems professionals are concerned. Because of a severe economic downturn in St. Louis, many IS professionals are out of work and see few prospects for employment on the horizon. However, their Kansas City counterparts are, for the most part, enjoying stable employment, thanks to a more resilient economy.

For example, when St. Louis-based McDonnell Douglas Corp. lost a government contract last year, the company laid off approximately 4,000 workers. "Now, there's a glut of IS professionals out there whose experience is job-specific to defense contracting. Their skills are not readily transferable to other industries," says Darrell Parrish, branch manager at Source EDP's St. Louis office. Parrish adds that this is the worst market he's seen in more than seven years in St. Louis.

According to Parrish, there are so many IS professionals looking for work and not finding it in St. Louis that many are considering options such as retraining, changing careers or relocating. However, most people in St. Louis want to stay because they consider it a good place to live and, until recently, a good place to work. They credit the urban revitalization program that began in the 1960s, which was sustained throughout the '70s and '80s, with making St. Louis a desirable city.

No place like home

Recruiters in Kansas City report a basically healthy economy in what some residents affectionately think of as a "big, small town." Programmers with about four years of experience are having no trouble finding jobs, particularly in companies with smaller IS departments. However, Trans World Airlines, Inc.'s recent reduction in work force and noticeable slowing of new hires among senior systems analysts and middle managers earning upward of \$40,000 could be indications of a softening market.

Even so, it appears that Kansas City is better prepared to weather a recession than St. Louis because of the difference in the two cities' economic bases. While St. Louis is larger and is home to more Fortune 1,000 companies, a disproportionate number of programmers, analysts and managers were employed by the defense industry.

Companies that provide services to the defense industry have been greatly affected. Southwestern Bell Corp., for example, announced a hiring freeze in November, and no thaw is in sight.

Kansas City boasts diversified industries with no one field claiming the bulk of IS professionals, thereby reducing the risk that hundreds would be affected by a downturn in one area such as defense.

IS saves money

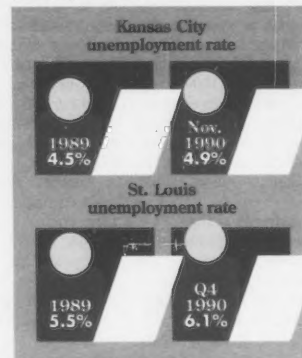
Employment experts on both sides of the state are quick to point out that the information services area is not as severely affected by corporate downsizing as some other professions. Even during downturns, when some departments are completely eliminated, companies must maintain a small IS staff to keep the business running smoothly. "Companies recognize that IS professionals save them money," says Randy Pace, IS manager at Robert Half International, Inc.'s St. Louis office.

That perception may be truer than ever. One trend having an impact on both cities is the availability of contract labor in the marketplace. Some companies that cannot hire full-time employees bring in programmers and systems analysts for specific projects. Occasionally, companies dangle the carrot of permanent employment when hiring contractors for temporary work. These "intent to hire" agreements say that if the person turns out to be a good fit for the company, and if the company is allowed to hire, the short-term assignment may become a full-time job.

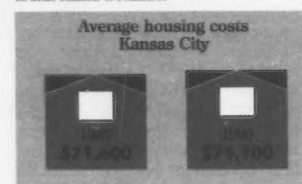
Many out-of-work IS professionals, particularly in St. Louis, leap at these opportunities because job openings are scarce. Now, even flourishing companies are using the "try before you buy" method of hiring. In fact, the practice is so common that recruiting firms are offering the arrangement to their client companies and to the IS professionals they recruit.

There are exceptions, however. General Dynamics Corp. in St. Louis recently downsized and is at a complete hiring standstill. According to Cindy Rosburg in General Dynamic's human resources department, the company "is discouraging contract labor" by having the president or other high-level executives approve requests.

The IS professional most likely to be chosen for assignments in St. Louis or Kansas City fits the same profile: "one who has a combination of technical skills and business knowledge," says David Pitt, IS recruiter at Dunhill of Topeka in Topeka, Kansas. "Most employers are looking for people with CASE experience and an



Source: Greater Kansas City Chamber of Commerce, St. Louis Chamber of Commerce



Source: National Association of Realtors

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• Federal government	
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• Allied Signal Aerospace	
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• Ford Motor Co.	
• J.C. Penney Co.	
Largest employers St. Louis (By number of employees)	
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• Schnuck's Markets, Inc.	
• May Department Stores Co.	
• Anheuser-Busch Co.	
• Boatmen's Bancshares, Inc.	
• Trans World Airlines	
• Southwestern Bell Telephone Co.	
• Washington University	
• Monsanto Co.	
• St. Louis University	

Source: Chamber of Commerce

understanding of the IBM AS/400. These factors make a person more marketable. Anyone who has been too removed from current technology will have a tough time finding a job."

Positions phased out

Indeed, Mark Mabe, MIS director at Missouri Western State College in Kansas City, has phased out several existing positions and replaced them with updated ones. To keep up with users' demands, Mabe changed the MIS group's focus from supporting operations for a central computer system to providing data communications, networking, data cabling and personal computer support in his Hewlett-Packard Co. shop. "We're doing more with the same number of people," he says.

Digital Systems Consultants, Inc. in St. Louis, a software services company, makes it a policy to hire individuals who

possess "good programming skills, ability in several languages, database knowledge and a background in a variety of projects," according to Steve Martak, a recruiter with the firm.

When scientific engineering consulting assignments lagged, the company was able to redirect its cross-trained professionals to the booming commercial side of the business, which provides VAX, VMS and Unix software services.

Most people in St. Louis say the downturn has reached bottom, and those in Kansas City express a guarded optimism that their economy will remain strong. All agree, however, that the IS professional best prepared for any uncertainty is the one who is highly marketable, mobile and motivated.

Vitiello is a speech writer and free-lance journalist based in East Brunswick, N.J.

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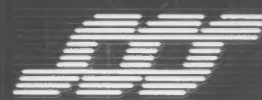
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SYSTEMS & SOFTWARE ANALYST. Design and develop software engineering environment for computer integrated manufacturing software development projects targeted at the chemical process engineering market. As part of the development of an on-line optimization software system for supervisory control of chemical processes, design and implement programs to coordinate information exchange between various components of the system. Consult with clients regarding network communication needs and hardware/software requirements. Install and configure hardware/software system at client sites, and administer local area network of computers, workstations and PCs. 40 hrs/wk, M-F, Dept in Computer Science. Must have background in UNIX and VMS operating systems as well as FORTRAN, C and PASCAL languages. Must have strong engineering background. Must have knowledge of networking workstations and PCs. \$38,500/yr. Apply at the Texas Employment Commission, Houston, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, Job Order #6342731. Ad Paid by an Equal Employment Opportunity Employer.

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HARDWARE ENGINEER: Update, test, and develop various printed circuit boards such as extension memory speed disk control card. High resolution graphic card to insure integration into an IBM type personal computer. Will assume proper systems structure integration and that color display output meets manufacturer's and government standards. Will design and adjust circuit boards as required to insure manufactured personal computer product is of high quality and that appropriate hardware and software integration will take place. Will review current market of chips and processors and design products to meet updated specifications. Will design, adjust, and produce appropriate digital logic circuits. Requires B.S. degree in Computer Science or Electronic Engineering. Also requires one year experience in the job to be performed. Hours: 9:30 a.m. - 5:30 p.m. 40 hours per week at \$13.76 per hour salary. Must have proof of permanent legal authority to work in the U.S. Please send resume to: Illinois Dept. of Employment Security, 401 S. State St., 3 South, Chicago, IL 60605, ATTN: L. Donegan, Reference #V4-21480. No Calls. An Employer Paid Ad.

Computer Systems Analyst to design, analyze and develop highly sophisticated computer software and codes, including applications, system integration and debugging. Provide support to customers on AIX Version 3.0 for the RISC 6000. Install and maintain IBM RISC 6000 machines and maintain continuity of business operations by bridging with both midrange and mainframe (IBM/VME) host environments. BS in Computer Science plus coursework in Pascal, Cobol "C", simulation and modeling. Demonstrated ability to create relational database management system. Demonstrated ability to utilize 4th generation database language and Unix operating systems. 40 hrs/wk. \$35,000/yr. Send resume to Mr. George Seiser, Iowa Department of Job Service, 1000 East Grand Avenue, Des Moines, IA 50319. Refer to Job Order No. 1100005.

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To plan, direct and support user requirements for designing and implementing computer/control systems of the plant. Reviews any process control deficiencies/requirements and proposes solutions. Provides directions to Systems Engineers in the implementation and support of computer systems, advanced control systems, SCADA systems and DCS systems.

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To assist in specifying new computer based systems. Analyses user requirements and assists in preparing detailed specification. Provides system support for existing computer based systems including SCADA, DCS systems. Supervises interconnection of different computer/control systems. The candidate should have a B.Sc in Computers or equivalent with a minimum of 5 years experience in real time computer system hardware and software within the oil/gas industry. Good knowledge of English is essential.

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To plan and control all process control activities in the plant with focus on control strategies and advanced control applications. Participates in the design and implementation of any new control strategies, evaluates existing ones and advises of any modification required.

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FIRST DIRECTOR OF THE INTERNATIONAL INSTITUTE FOR SOFTWARE TECHNOLOGY (IINIST), MACAU

The International Institute for Software Technology (IINIST) to be established in Macau, is a research and training centre of the United Nations University concerned with the application of advanced computer software technology to the needs of developing countries. Specifically, the Institute shall carry out research on software technology relevant to the needs of developing countries; award fellowships for research and advanced training in software technology and management of software projects, especially for young scientists and technologists; disseminate knowledge of the technical, organizational, and management aspects of producing software; carry out specific projects involving software development, training and related services; and organize conferences, seminars, workshops and panels.

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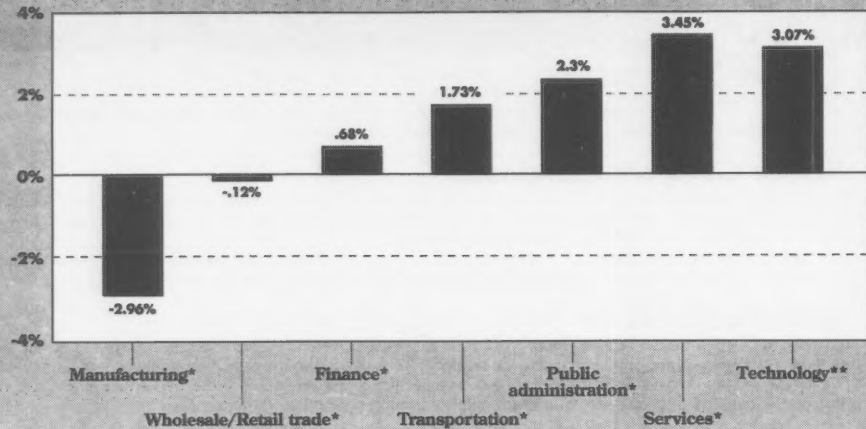
Computerworld/CorpTech Career Index

Technology and service industries led all others in employment growth during 1990

Percent change in number of employees from December, 1989 to December, 1990

*Source:
U.S. Dept. of Labor,
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Data Processing

AS/400 S/38



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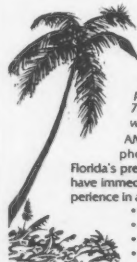
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MARKETPLACE

When a vendor files for bankruptcy

Laws can protect users, and steps can be taken to minimize the impact

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY DENNIS S. DEUTSCH
SPECIAL TO CW

You're a corporate information systems buyer, and you just found out the firm that sold you thousands of dollars worth of software one year ago has just filed for bankruptcy. What does that mean to your users? Fortunately, the law provides users with some protection, and there are specific steps that can be taken to minimize the impact of such an event.

Until recently, when a software vendor filed for bankruptcy, users suffered heavy consequences and were at the mercy of the bankruptcy court. For example, they could be restricted from using the software they had obtained from the vendor before the bankruptcy was filed. But today, some of those restrictions have been eased, and for the most part, it's business as usual unless the user has a grievance to take up with the vendor's provision of the software.

One issue for users to be concerned about is the license agree-

ment and what it or other agreements executed at the same time provide for when a vendor goes bankrupt. For example, users may unknowingly waive certain rights if they continue to pay the license fees and use the software. Users also need to know that they have to go through the bankruptcy trustee, who holds a lot of clout in determining their rights to continued use of the software as well as service and support.

Panic button

Overall, users shouldn't panic. Bankruptcy does not necessarily mean that the vendor company will cease to operate. There are various forms of bankruptcy in which a business or corporation can choose to file.

If the vendor is a corporation, it may file for Chapter 11, which, in effect, is a business reorganization. This will provide the vendor with relief from its debtors for the purpose of restructuring its debt so it can work toward removing itself from bankruptcy.

The key here is that the vendor intends to continue to operate, albeit under the direction of a trustee appointed by the bankruptcy court. In a Chapter 11 filing, it is the vendor's intention to

continue to service its customers. If the vendor is a partnership or owned by an individual proprietorship, the same may be achieved. The vendor continues in business and continues to operate under the auspices of the bankruptcy court.

However, vendors can file for Chapter 7, a more drastic form of bankruptcy in which the vendor ceases to operate and its assets are liquidated, with the proceeds being distributed among the creditors. Even in this case, though, users may still obtain the right to continue to use their software.

Users need to understand their rights in using licensed software obtained from vendors that file for bankruptcy. Until 1989, this situation presented a very real problem for the computer industry: All users were at risk of having their rights terminated in the event of the vendor's bankruptcy. In 1988, however, Congress alleviated this problem by passing the "Intellectual Property Bankruptcy Act of 1988," which is an amendment to the Bankruptcy Code. By the terms

of this amendment, a user can elect to retain his rights to continue to use licensed software.

The downside of this provision of the code, however, is that even though it provides additional protection to software users, it also provides a trade-off for the protection of the bankrupt vendor's creditors. If a firm elects to continue to use the software, it must continue to pay any fees due the vendor pursuant to the license agreement. The election to do so also serves to waive a firm's right to any claim it may have under the license agreement against the vendor.



For example, suppose a user does not feel as though the vendor has totally lived up to its contractual obligation. As a result of his dissatisfaction, he is considering either suing the vendor or filing a claim for arbitration against the vendor. At this point, the vendor files for bankruptcy. A user's election to continue to use the software will require him to pay any outstanding licensing fees. But in so electing, he is waiving his rights to make any legal claims against the vendor in the future.

To elect to confirm the contract once the vendor goes bankrupt, a user must state his intentions in writing and address them to the trustee of the bankrupt

vendor's case. The name and address of the trustee assigned to the case can be obtained by calling the bankruptcy court clerk or by writing to the court where the vendor has filed — most often in the district where the home office of the vendor is located.

State your interest

Users should also contact the trustee if they want to obtain continued service and upgrades. The user should indicate his interest in the vendor and attempt to ascertain what the intention of the trustee is with respect to providing service. If the user is not under an existing maintenance agreement, the vendor is not obligated to provide him with any service.

Remember, if the vendor has filed for Chapter 11, its best interest is to continue to support its users. Income from providing users with that service is one way a vendor can pull out of the bankruptcy hole.

Next week's legal column will explain how users can protect themselves through an escrow agreement to provide for the continued maintenance of their software in the event of a vendor's bankruptcy.

Deutsch practices computer law in Hackensack, N.J., and is an adjunct associate professor of law at Fordham University School of Law in New York.

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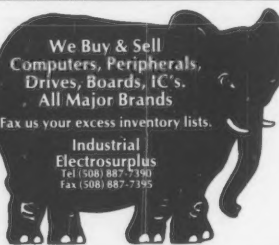
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	Closing price	Recent high	Recent low
IBM PC Model 176	\$300	\$450	\$200
XT Model 086	\$500	\$550	\$450
XT Model 089	\$500	\$625	\$400
AT Model 099	\$650	\$775	\$500
AT Model 239	\$775	\$925	\$700
AT Model 339	\$925	\$1,000	\$900
PS/2 Model 30-286	\$1,100	\$1,300	\$1,000
PS/2 Model 60	\$1,400	\$1,700	\$1,300
PS/2 Model 70P	\$3,300	\$3,500	\$3,000
Compaq Portable II	\$900	\$1,050	\$875
Portable 286	\$1,100	\$1,350	\$1,000
SLT 286	\$2,300	\$2,500	\$2,000
Portable 386	\$2,300	\$2,500	\$2,200
LTE 286	\$2,200	\$2,500	\$1,900
Deskpro 286	\$800	\$1,000	\$700
Deskpro 386/20	\$2,850	\$3,000	\$2,300
Apple Macintosh Plus	\$750	\$975	\$700
SE	\$1,150	\$1,350	\$1,100
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The RFP may be obtained from George Graner, AC Transit Information Services Department, 1600 Franklin Street, Oakland, CA 94612, during regular business hours or phone (415) 861-7120. To be considered, responses to RFP #91-14 an original plus ten (10) copies should be submitted to Bernell Thomas, AC Transit, Grants and Contract Department, Rm. 538, 1600 Franklin Street, Oakland, CA 94612-2806, no later than 4 p.m., Friday, April 5, 1991. If delivered by mail, the proposer is responsible for meeting this deadline.

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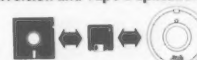
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- Computer-based training (CBT), which allows students to work at their own pace.
- Split classes, a method that divides the beginning and advanced students into separate classrooms.
- Student pairing, a partnership approach in which the more expert students aid the beginners.

Testing can help avoid the off-balance classroom predicament in the first place. Self-assessment tests usually consist of multiple-choice questions that probe a student's basic and intermediate

knowledge. The tests not only reveal levels of ability, but they can help trainers determine the overall training needs within their companies.

Trainers can also offer pre- and posttesting to students at the beginning and the end of the course. These tests measure initial experience levels, and they provide the student with a preview of the course. Questions should be organized by subject in the order in which the materials are presented in the course, either chronologically or in increasing order of difficulty. A comparison of the pre- and posttests' results will give the students confirmation of how far they have come and how much they have learned.

If evaluation testing isn't an option, trainers might want to consider the relatively new A-B-C methodology. This method, which requires experienced instructors and special course materials, allows the trainer to customize the course work to the student population.

Here's how it works: Each ma-

ior course topic is divided into three sections. Section A consists of vocabulary and basic concepts. Section B includes intermediate concepts and practical applications. Section C contains advanced concepts.

Each workshop is similarly split into three levels. Level 1 includes workshop basics such as definitions of data and job-control language, initialization of default options, program boilerplating and so forth. Level 2 is the meat of the workshop, where most of the work is done. Typically, level 2 will include several tasks for the student: some required, some optional and some "extra credit."

Level 3 contains advanced materials such as performance and optimization considerations, software tool use, interconnection with other workshops or cooperation with other users in a joint

project.

In practice, the trainer splits the advanced students to section B and C workshops, while beginners start at the lower end, working their way up.

Clearly, a lot of juggling is involved, but the method provides a great deal of flexibility in the training curriculum. The training is customized for the audience, thus maximizing the company's return on its training investment.

While the A-B-C tack is certainly innovative, the next option, CBT, is perhaps the most ideal solution for student diversity. One of the major advantages of CBT is that students start at their current level and work at their own pace with the trainer available for questions.

Trainers don't always have this option. CBT start-up costs are high, and it requires an expert course developer who must constantly update the techniques and information.

Dividing classes into two groups, placing the beginners with one instructor and the advanced students with another, is yet another approach.

However, this option is extremely resource-intensive because it requires two classrooms, two instructors and two sets of class materials. The advantage of this approach is that it gives the students quality education and the greatest payback in terms of individual attention.

One of the most common solutions is pairing beginners with advanced students — also known as "two at a terminal." The idea is for advanced students to assist and teach the beginners, thus freeing up a trainer's time to continue with the class.

However, while this solution may be the easiest for the trainer to implement, it is not necessarily

the best method for the students. Advanced students have a tendency to take over, and they are easily frustrated with a beginner's slow typing and may take control of the keyboard. This hinders the beginner's learning experiences, such as learning how to use a keyboard.

DETERMINING THE LEVEL of student ability with pretests can help avoid an off-balance classroom predicament in the first place.

Second, the advanced student may cover ground much too quickly for the beginner. The beginner then tends to learn the advanced student's shortcuts, rather than the basics of the course.

Picking the method that works for your environment involves making some tough decisions. To maximize the student's learning experiences, try either the A-B-C methodology or CBT. If you are strapped for resources, try student pairing. If you have plenty of staff and resources, split the students into two classes. In all of these cases, get the greatest benefit you can from your training dollar by using pretests to determine the level of student ability.

Lyon is a senior education consultant at Compuware Corp.



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Compaq Computer Corp.	Buy	Neutral	Hold
Computer Associates International, Inc.	NR	Neutral	Buy
Digital Equipment Corp.	Hold	Buy	Buy
Hewlett-Packard Co.	Hold	Neutral	Buy
IBM	Buy	Attractive	Hold
Lotus Development Corp.	Hold	Unattractive	Buy
Microsoft Corp.	Buy	Unattractive	Buy
NCR Corp.	Avoid	Neutral	Buy
Oracle Systems Corp.	NR	Unattractive	Buy
Sun Microsystems, Inc.	Buy	Neutral	Buy
Unisys Corp.	Avoid	NR	Hold

NR: Not rated

CW Chart: Paul Mock

ANALYSIS IN BRIEF

Apple Computer, Inc. may look forward to additional revenue thanks to royalty payments from **Microsoft Corp.**

Because a federal judge dismissed two of the three bases of Microsoft's defense against Apple's copyright infringement suit, the probability looms that Microsoft's Windows will ultimately be held to have infringed Apple's copyright on its icon-based operating system.

Microsoft's remaining card is the contention that the Macintosh/Windows approach to graphical user interfaces is the only logical way to construct such a system and thus cannot be protected by copyright. However, given that **Hewlett-Packard Co.** has developed a similar interface in a very different way, Microsoft's claim may not hold up.

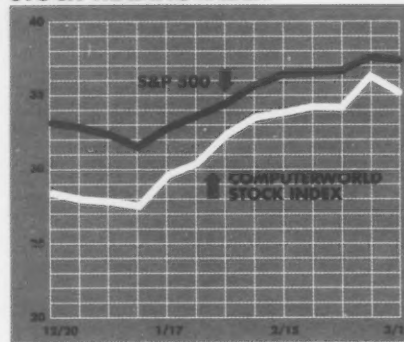
If Apple could put a hole in the Windows market, it could then fill that space with its own software ported to Intel Corp.-based machines.

However, because 60% of Apple's machines run Microsoft products, Apple would be hurting a major supplier of software to its own user base.

Therefore, Apple is likely to settle for a royalty payment in the range of 2% to 10%, which is traditional in such cases. Apple may also hit makers of Windows-based applications with royalty charges. However, any profit stream from royalties will be relatively short-lived, as Microsoft would redesign Windows to remove offending features as quickly as possible. — **Apple v. Microsoft — What Does Apple Want? Prudential Securities, Inc., March 11, 1991.**

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- AT&T said it would raise its per-share offer for NCR Corp. from \$90 to \$100 if NCR agreed to merger talks. NCR management did not budge; its stock price slipped 1 1/4 points last week to close Thursday at 96%. AT&T edged up 1/2 a point to 33%.
- Data General Corp. jumped 2 1/2 points — more than 21% — last week, closing at 12% after unveiling Avion 7000 and 8000 servers.
- Investors stomped IBM down 4% points to 128%. Some analysts have recently downgraded their ratings in anticipation of slightly lower first-quarter earnings due out in mid-April.
- February's book-to-bill ratio for the semiconductor industry shot up, according to the Semiconductor Industry Association, meaning that new orders outpaced shipped orders last month. Meanwhile, National Semiconductor Corp. advanced 3/4 of a point to 7% after posting profits of \$5 million for the third quarter.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, MARCH 14, 1991

TOP PERCENT GAINERS			TOP PERCENT LOSERS			TOP PERCENT GAINERS			TOP PERCENT LOSERS		
Alloy Computer Prod.	139.62	AST Research Inc.	-17.86	NYS	67.00	45.25	Auto Data Processing	62.38	-2.88	-4.41	
Wang Labs Inc. (b)	29.63	Alliant Computer Sys.	-17.83	OTC	60.25	32.00	Autodesk Inc.	47.25	-1.75	-10.85	
Phoenix Technologies	28.00	Infor Systems Corp.	-16.71	OTC	31.50	11.00	BGS Systems Inc.	30.25	-0.38	-1.00	
Anacomp Inc.	25.00	Dynatech Corp.	-16.16	OTC	43.88	17.75	BMC Software Inc.	41.00	-1.75	-4.00	
Comshare Inc.	22.39	Autodesk Inc.	-5.75	OTC	21.50	11.00	Boole & Babbage Inc.	15.00	0.00	0.00	
		Borland Int'l	-5.50	OTC	25.50	14.00	Borland Int'l	48.25	-5.50	-11.50	
				NYS	11.88	0.88	Business Intl.	2.63	0.13	0.50	
				OTC	18.63	4.50	Cognex Inc.	15.63	-2.00	-11.35	
				NYS	18.88	3.88	Computer Associates	9.25	-1.13	-0.38	
				OTC	17.75	7.75	Computer Horizons	12.25	-1.00	-7.55	
				NYS	64.00	38.75	Computer Sciences	61.50	-1.75	-7.77	
				OTC	11.75	6.63	Computer Task Group	10.63	-0.38	-1.00	
				OTC	25.25	13.00	Comshare Inc.	20.50	3.75	22.39	
				OTC	16.00	3.75	Corporate Software	11.25	-0.50	-4.26	
				NYS	47.00	27.88	General Motors E (EDS)	44.13	0.88	1.13	
				OTC	18.75	7.25	Goal Systems Int'l	16.50	-1.25	-7.00	
				OTC	4.75	1.88	Hogan Systems Inc.	4.00	0.00	0.00	
				OTC	12.00	5.00	Index Technology	11.00	-0.38	-1.13	
				OTC	19.13	7.75	Information Resources	17.38	-1.75	-9.15	
				OTC	17.50	2.63	Inform Corp.	5.88	2.25	4.44	
				OTC	7.58	1.38	Interleaf Corp.	2.58	0.31	1.00	
				OTC	8.00	2.50	Interleaf Inc.	6.38	0.88	15.91	
				OTC	40.00	10.00	Knowledgeware Inc.	37.38	0.88	-2.29	
				OTC	45.00	16.75	Legend Corp.	38.75	-3.63	-8.33	
				OTC	39.25	12.50	Lotus Development	25.68	-0.13	-0.48	
				OTC	13.00	3.63	Micrograph	20.00	0.75	3.90	
				OTC	113.00	50.75	Microsoft Corp.	98.00	-0.00	0.00	
				NYS	10.13	4.00	On Line Software Int'l	11.10	0.88	9.46	
				OTC	28.50	1.50	Oracle Systems	9.50	3.38	4.11	
				NYS	17.88	7.00	Parsons Systems	10.00	0.00	0.00	
				OTC	7.88	1.25	Phoenix Technologies	7.88	1.63	26.00	
				NYS	52.00	31.63	Phoenix Management Sys.	46.00	-2.25	-4.48	
				OTC	23.63	11.50	Reynolds & Reynolds	20.13	0.13	0.13	
				OTC	18.13	8.88	Sage Software Inc.	10.75	-0.25	-2.27	
				OTC	19.13	12.25	Shared Medical Systems	16.38	0.75	3.13	
				OTC	35.25	12.00	Software Publishing Corp.	28.75	-2.25	-12.88	
				OTC	13.13	4.38	Starling Software	12.75	-0.13	-0.97	
				OTC	28.00	5.50	Sungard Data Sys.	12.75	0.00	0.00	
				OTC	45.50	17.75	Symantec Corp.	43.00	-1.25	-8.82	
				OTC	24.63	8.00	System Center Inc.	8.00	0.75	10.34	
				OTC	37.25	12.75	System Software Assoc.	21.00	0.75	-1.64	
				OTC	27.38	4.75	Waltak	15.00	-0.25	-0.64	
Communications and Network Services			Off 0.13%			Semiconductors			Off 1.87%		
OTC 19.00	5.38	3 COM Corp.	8.88	-0.50	-5.33	NYS 25.88	19.38	Advanced Micro Devices	22.00	-0.63	-2.62
NYS 69.75	52.50	American Intl Techs Corp.	80.88	1.25	1.83	NYS 11.88	5.50	Analyst Devices Inc.	10.75	-0.75	-8.76
OTC 44.13	29.00	AT&T	33.88	0.50	1.50	OTC 1.00	0.75	Applied Microsystems	10.75	-0.75	-8.76
OTC 9.63	0.88	Artel Communication Corp.	2.75	-0.13	-0.35	OTC 52.75	28.00	Intel Corp.	47.50	-4.25	-8.82
NYS 58.25	39.50	Bell Atlantic Corp.	47.13	-0.50	-1.00	NYS 13.00	5.13	LSI Logic Corp.	9.13	3.38	4.29
OTC 57.63	49.00	Beltsouth Corp.	52.38	0.25	0.40	OTC 16.75	6.75	Motorola Inc.	1.13	1.13	1.13
OTC 19.50	8.25	Compression Labs Inc.	19.50	1.25	6.85	NYS 88.38	45.75	National Semiconductor	62.63	-2.00	-3.09
NYS 41.00	23.38	Conitel Corp.	41.00	0.75	8.57	NYS 8.88	3.00	Texas Instruments	7.63	0.63	9.83
OTC 12.88	3.50	Digital Comm. Assoc.	4.75	0.38	8.57	OTC 45.75	22.50	VLSI Technology	42.38	-0.38	-7.82
NYS 28.75	8.88	Dynatech Corp.	17.50	-0.88	-4.78	OTC 12.25	3.00	Western Digital Corp.	8.63	0.50	-6.14
OTC 25.25	12.25	Electronic Int'l Inc.	20.75	-4.00	-16.16						
OTC 12.88	3.50	General Datacomm Inds.	9.25	0.13	1.37						
OTC 4.00	1.75	General Datacomm Inds.	2.88	0.00	0.00						
NYS 4.50	1.63	ITT Corp.	58.63	-0.83	-1.09						
NYS 34.13	23.50	MC Communications Corp.	28.50	-1.00	-3.64						
OTC 6.75	0.75	Microcom Inc.	6.25	0.25	4.17						
NYS 60.88	40.25	Network Equipment Tech.	8.50	1.50	21.43						
OTC 44.13	17.88	Network General	26.13	-3.50	-1.88						
OTC 21.00	27.25	Network Systems Corp.	13.00	1.00	8.33						
NYS 34.00	8.00	Northern Telecom Ltd.	31.75	0.13	0.40						
OTC 14.63	3.00	Nynex Corp.	48.00	-0.13	-1.77						
OTC 15.50	8.13	Pacific Telesis Group	40.38	-1.25	-3.00						
NYS 32.00	22.13	Pentel Corp.	14.25	1.63	12.87						
OTC 17.75	7.25	Scientific Atlanta Inc.	15.88	0.13	0.79						
NYS 89.50	67.00	Southwestern Bell Corp.	53.75	-0.38	-0.69						
NYS 47.88	38.25	United Telecom	26.13	-3.50	-1.88						
NYS 14.25	4.75	US West Inc.	37.88	0.00	0.00						
NYS 29.13	8.88										
NYS 58.50	47.25										
NYS 46.38	20.63										
NYS 40.75	32.38										
Computer Systems			Off 3.12%			Peripherals & Subsystems			Up 4.09%		
OTC 8.75	0.58	Alliant Computer Sys.	1.44	-0.31	-17.83	OTC 2.00	0.09	Alpha Computer Prod.	0.75	0.44	139.62
NYS 18.88	10.00	Amstel Corp.	15.25	-0.75	-4.69	OTC 2.25	0.88	Aperius Technology	1.94	0.00	0.00
OTC 68.25	24.25	Apple Computer Inc.	65.25	-2.00	-2.97	OTC 24.00	7.50	Banctec Inc.	11.75	0.25	0.17
OTC 13.88	4.25	Archive Corp.	7.38	-1.38	-15.71	NYS 10.13	1.13	Cognitronics Corp.	9.38	-0.38	-3.85
OTC 29.25	7.50	AST Research Inc.	23.00	-5.00	-17.86	OTC 14.00	7.50	Conner Peripherals	2.50	0.00	0.00
NYS 7.38	3.88	Bolt, Beranek & Newman	6.50	-0.25	-3.70	OTC 22.00	7.00	Dataram Corp.	11.25	1.25	10.00
NYS 18.88	4.50	Commodore Int'l	17.38	0.13	0.72	NYS 10.88	2.25	EMC Corp.	8.50	0.25	3.03
NYS 74.25	35.50	Compaq Computer Corp.	64.88	-8.13	-8.63	OTC 37.25	33.75	Eastman Kodak Co.	45.13	0.13	0.13
OTC 2.63	0.13	Computer Automation Inc.	1.08	0.06	6.30	OTC 9.88	4.38	Emulex Corp.	8.63	-0.38	-1.47
NYS 21.63	6.75	Control Data Corp.	11.75	-1.00	-7.84	OTC 34.50	14.00	Evans & Sutherland	19.50	-2.75	-42.38
NYS 20.88	8.38	Corvus Computer Inc.	18.75	-1.83	-9.35	OTC 28.25	6.75	IPL Systems Inc.	25.50	2.00	8.51
NYS 51.25	20.00	Cray Research Inc.	41.50	-0.88	-2.08	OTC 1.54	0.13	Master Systems	0.75	0.06	9.01
NYS 13.25	3.50	Data General Corp.	12.13	2.13	21.25	OTC 17.88	6.50	Master Graphics	1.00	0.13	0.13
NYS 3.38	0.75	Datapoint Corp.	2.75	0.00	0.00	OTC 13.38	3.88	Microprobe Corp.	11.25	-0.75	-8.25
OTC 28.88	7.00	Del Computer Corp.	26.13	-0.50	-1.88	OTC 93.75	73.63	3M Corp.	91.25	0.50	0.55
NYS 95.13	45.50	Digital Equipment Corp.	77.00	-4.75	-5.81	OTC 21.25	8.50	Pentstrop Inc.	19.00	0.25	1.33
NYS 40.88	7.75	Electronic Int'l Inc.	40.88	-0.25	-9.95	OTC 27.25	12.38	Quantum Corp.	24.88	-1.38	-5.24
NYS 50.63	24.88	Hewlett-Packard Co.	48.50	-1.25	-2.51	OTC 19.38	5.63	Reconix Corp.	18.00	0.00	0.00
NYS 138.75	95.25	IBM	128.13	-4.38	-3.30	OTC 19.38	5.63	Seagate Technology	15.13	-0.38	-1.47
OTC 14.00	7.75	Intergraph	12.63	-0.75	-5.57	OTC 19.38	5.63	Storage Concepts	8.83	0.13	1.47
OTC 25.75	10.50	Intellinet	24.00	-1.00	-4.00	OTC 19.38	5.63	Sungate Technology	15.13	-0.38	-1.47
NYS 3.13	0.50	MAI Systems Corp.	0.88	-0.08	-6.72	OTC 19.38	5.63	Tandem Corp.	3.50	-0.25	-6.67
NYS 148.88	114.00	Mesa Electronics	134.25	-3.25	-2.38	OTC 19.38	5.63	Tektronix Inc.	21.75	-0.88	-6.67
OTC 26.00	9.00	Mentor Graphics Corp.	15.00	-1.75	-10.45	OTC 19.38	5.63	Telex Corporation	56.13	-1.88	-3.23
NYS 99.25	44.50	NCR Corp.	98.38	-1.63	-1.86	OTC 19.38	5.63	Xerox Corp.	56.13	-1.88	-3.23
OTC 35.50	11.00	Pyramid Technology	22.63	-0.50	-2.10						
OTC 34.00	9.75	Sequent Computer Sys.	18.63	-2.13	-11.33						
NYS 47.25	18.00	Silicon Graphics	41.00	-3.50	-7.87						
NYS 25.13	14.63	Sony Corp.	24.00	-0.50	-1.50						
OTC 37.25	15.00	Sun Microsystems Inc.	33.38	-1.25	-3.61						
NYS 30.13	8.88	Tandem Computers Inc.	14.75	0.13	0.85						
NYS 39.50	23.50	Tendy Corp.	37.75	-3.25	-2.24						
OTC 35.50	7.63	Teradata	16.75	-1.50	-8.22						
NYS 7.88	1.38	Uniscorp Corp.	41.00	-0.13	-2.44						
NYS 16.00	1.75	Unisys Corp.	4.83	0.13	2.27						
NYS 16.00	1.75	Wang Labs Inc. (b)	5.38	1.00	29.63						
Software & DP Services			Off 0.36%			Leasing Companies			Up 2.94%		
OTC 53.50	17.00	Adobe Systems Inc.	48.25	-6.75	-12.74	OTC 16.00	6.88	Amplicon Inc.	14.75	-0.25	-1.67
OTC 51.25	16.75	Adus Corp.	47.25	-3.50	-5.90	OTC 4.28	0.31	Capital Associates	0.98	0.00	0.00
OTC 24.88	12.50	American Mgmt. Systems	23.75	-0.75	-3.14	OTC 16.25	9.25	Comdisco Inc.	2.25	22.38	16.82
OTC 18.75	7.00	American Software Inc.	12.13	-0.50	-3.77	OTC 5.88	2.25	LDI Corporation	3.75	1.00	7.84
OTC 16.13	1.38	Analog Inc.	3.75	-0.75	25.00			Selecor Inc.	13.75	0.00	0.00
OTC 23.50	10.00	Analysts Int'l	18.75	-0.50	3.08						
OTC 4.63	0.88	Ashken Tech.	8.63	-0.50	-6.63						
OTC 10.00	4.00	AT&T	10.00	-0.38	-1.54						

Laws

FROM PAGE 1

Forecast International, a defense market research firm in Newtown, Conn.

- Allied casualties from "friendly fire" show the need for improved target recognition systems and other methods of distinguishing friend from foe, especially when multinational forces are involved, said Richard Thomas, director of the Center for Strategic Technology at Texas A&M University. "If we had sold M1 tanks to Saddam Hussein, how would we tell who is inside them?"

- Cloud cover in the early days of the air campaign hampered bomb targeting and damage assessment because only one of the allies' seven imaging satellites was capable of seeing through cloud cover, said John E. Pike, space policy analyst at the Federation of American Scientists in Washington, D.C.

designed to protect civilian areas. In a Feb. 15 speech at the Patriot's manufacturing plant in Andover, Mass., Bush praised the system for intercepting 41 of the 42 Scud missiles it engaged.

The Patriot missile, one of the many high-tech heroes in the war, did not start out as a Scud-buster. It was originally designed to hit enemy aircraft and ignore missiles, but in 1984 the U.S. Army began to upgrade the Patriot's computer software so it could intercept missiles, too.

"It is a very software-intensive system and deliberately so. That way we can play with the system's operational capabilities by changing the software," said David Harris, spokesman for the U.S. Army Missile Command near Huntsville, Ala.

In fact, the Patriot's guidance software was fine-tuned several times during the war to improve its chances of hitting the Scud warhead and hitting it earlier. The software upgrades were flown from the U.S. to the war

on mobile ground stations that would track enemy launches on a more local level, Baranaukas explained.

The highest praise went to the allies' command and control systems, which created a web of communications links among air and ground forces. "In light of previous command and control fiascos [such as poor coordination of the Grenada invasion], this gets an A+," Shaffer said.

Analysts said the only caveat to their glowing reviews is that Iraq turned out to be a disorganized, low-tech enemy that made no effort to disrupt the high-tech systems, so their robustness was not really tested. Also, "we're not always going to have six months to get ready for a war," Thomas noted.

Shaffer said the computer-intensive Airborne Warning and Control System (AWACS) planes did an outstanding job coordinating the air campaign and directing air support for the ground war, while battlefield commanders were able to download intelligence data from satellites via direct data links.

A small mainframe computer at the U.S. Central Command in Riyadh, Saudi Arabia, was responsible for generating a single Air Tasking Order for the coalition air forces [CW, Jan. 28]. On a daily basis, it matched the military firepower to the selected targets and set the sequence of events so, for example, a fighter would not be flying over the explosion caused by a cruise missile.

Thousands of computers of all shapes, sizes and ages were used in the Persian Gulf theater, ranging from Grid Systems Corp.'s laptop microcomputers and Compuadd Corp.'s 1486-based desktop systems to Hitachi Data Systems Corp.'s mainframes. Many of the Marines' microcomputers were linked on Banyan Systems, Inc. local-area networks, said Lt. Col. Larry Sims, head of technical services for the U.S. Marine Corps in Quantico, Va., while other services used Novell, Inc. LANs.

The satellite-intensive network for Operation Desert Storm, called the ODS-Net, was created by the U.S. Army Information Systems Command at Ft. Huachuca, Ariz. Col. Steven C. Harman Jr., who oversaw the network design and installation, said the network can be reconfigured rapidly to route data traffic around battle-damaged sections.

ODS-Net consists of 20 sub-networks managed by a network control center known as "the AWACS of the Saudi network" because it monitors the collection of routers, bridges, packet switches and satellite trunks. A typical message transmitted via satellite from the Persian Gulf travels more than 46,000 miles and takes less than three seconds to reach the U.S.

U.S. details price of business with Iraq

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — More than \$500 million in U.S. computer equipment and other high-tech gear was shipped with government approval to Iraq in the five years leading up to the Aug. 2 invasion of Kuwait, the U.S. Department of Commerce revealed last week.

Details of the exports have fu-

keep track of people," he said.

A congressional source looking into the exports said the equipment for the personnel databases came from Sperry Corp., which later merged with Burroughs Corp. to form Unisys Corp. A spokesman for Unisys would not comment except to say the firm had followed all applicable laws and regulations.

Washington attorney Paul Freedenberg, who was under

Boom-ing business

The U.S. Department of Commerce approved two-thirds of all licensing petitions for exports to Iraq during the five years before the Persian Gulf war

U.S. license applications for exports to Iraq, 1985-1990

	Approved	Rejected	Returned without action
Applications	771	39	323
Dollar value	\$1.5B	\$27M	\$442M

Exports included computer and communications systems, integrated circuits, mapping and photographic equipment, communications countermeasures gear, flight simulators, chemical and biological agents, underwater detection equipment, trucks and helicopters

Source: U.S. Department of Commerce

CW Chart: Tom Monahan

Howitzer hang-up



The computer in Capt. Owen Englander's Howitzer battery was both a curse and a blessing.

In case of an amphibious assault by Marines, which did not occur during the war, Englander was prepared to move his battery of six Howitzer artillery guns ashore. The guns are controlled by the Battery Computer Sys-

tem, which can transmit firing orders to guns spaced hundreds of yards apart and still have the shells strike the target at the same time. Previously, the Howitzers had to be kept close together for manual firing instructions, which made them more vulnerable to enemy attack, Englander told a pool reporter aboard the USS Gunston Hall.

However, 1st Lt. Steve White said the computer is not user-friendly. It is supposed to keep track of ammunition stocks as shells are fired, but White said it is easier to keep track in a log-book. In addition, White has a crew that performs all firing calculations manually as a backup and to ensure that gunnery officers can still do it the old-fashioned way.

- Satellite cameras looking for Iraqi missile launchers were defeated by camouflage, tunnels and even ditches, according to Jeffery Shaffer, a military analyst at the Center for Strategic and International Studies in Washington, D.C. Commanders found that the surest way to locate the mobile launchers was to rely on people, by having scouts sneak behind enemy lines in superquiet dune buggies.

Nevertheless, the use of technology in the war earned high marks from defense analysts. "The electronics worked darn well. It's really hard to find fault," said Ron Hertenstein, vice president of Forecast International.

Analysts said the computer-guided Patriot missile system worked remarkably well in knocking down Iraqi Scud missiles headed for Israel and Saudi Arabia, considering it was never

zone and distributed to Patriot batteries in Israel, Saudi Arabia and Turkey, Harris said.

In contrast, the Scud launch detection system was hatched from a system designed to pick up intercontinental missile launches from the Soviet Union, which would provide about 30 minutes' warning time, according to Baranaukas.

The encrypted satellite data indicating a Scud launch had to be sent to the North American Aerospace Command in Colorado, where the signal was picked up by large specialized dishes, processed by mainframes and then relayed to the Middle East. There was no time to put bulky, specialized dishes in the desert, so there was no direct link from these satellites to the ground commanders. Under the revamped Strategic Defense Initiative program, the U.S. Department of Defense is working

eled charges that the U.S., in its tilt toward Iraq during the Iran/Iraq war, unwittingly handed Saddam Hussein much of his ability to wage mischief on a grand scale.

Government officials refused to identify suppliers or speculate about the uses to which the equipment was put, saying only that it generally was not suitable for military applications.

A 110-page computer print-out released by the department last week showed exports of "computing equipment" such as the following:

- \$1.1 million shipment to an "Arab company" to "control and monitor the production of detergent chemicals."
- \$2.8 million shipment to the Iraqi Atomic Energy Commission — use not specified.

Critics skeptical

Given reports of Iraq's efforts to develop chemical and atomic weapons, administration critics were skeptical about claims the technology had no military use. "Many of the sales went to sites identified as military, sites which were subsequently bombed," said Gary Milhollin, director of the Wisconsin Project on Nuclear Arms Control.

Milhollin said two sales of computer equipment — each for \$8.7 million and each licensed for use by the Iraqi Interior Ministry for a "personnel database" — were especially troubling. "It's highly likely that was used for internal security purposes, to

secretary of commerce for export administration when many of the exports were approved, acknowledged that some sales to Iraq should not have been allowed. "Knowing Saddam Hussein now, we don't want to sell him anything. But at the time, it made sense. The White House didn't want to tilt against Iraq, and the Commerce Department had no legal justification for [blocking exports there]."

Reports that the U.S. is preparing to ship Brazil an IBM vector-processor add-on to an IBM mainframe computer, boosting it to a supercomputer-class machine, have caused critics to charge that the administration has not learned a lesson from the Iraq experience.

Brazil meets only one of six nuclear nonproliferation credentials required for the import of U.S. high-performance computers and the computer is to be used by the Brazilian aircraft manufacturer Embraer, which a Brazilian newspaper said last May was selling Iraq technical services and helping it "to improve the performance of the Soviet Scud missiles."

Embraer severed its ties to Hussein under public pressure after the invasion of Kuwait.

"Why the hell is the White House doing this? Their answer is, the export comes with guarantees to only do peaceful calculations," a congressional source said. An IBM spokesman said IBM had carefully followed all export licensing rules.

NEWS SHORTS

Mouse creator honored

Douglas C. Engelbart, 66, a computer visionary who conceived the idea of desktop computing in 1951 and later invented the mouse user interface, received the 1991 Coors American Ingenuity Award last week. Engelbart also developed word processing, database software, split screens, computer graphics and windows at the Stanford Research Institute in the 1960s, but his work was ridiculed by the mainframe-oriented computer industry at the time. Past winners of the award, which honors unsung heroes of innovation, include technology pioneers John Atanasoff, Jack Kilby and George Dantzig.

IBM takes CIM to mainframe

IBM announced a series of mainframe-based software applications last week to help manufacturers manage and control a range of production functions in computer-integrated manufacturing (CIM). The CIM Production Planning Series/MVS and VSE includes 11 modules that form the basis for a manufacturing resource planning system. Among the potential benefits IBM is promoting with the new software series are reduced inventory, better control of engineering changes and increased responsiveness to market demands. The applications, slated to be available the third quarter of this year, will run under DB2 on both Enterprise System/9000 and System/370 machines and will utilize the common user access windowing facility of IBM's Systems Application Architecture.

Vendors sign with software council

When a corps of software vendors in search of better business ethics within their industry sector launched the Software Business Practices Council (SBPC) last fall, skeptics wondered how far the group's self-policing efforts could range while major players such as Computer Associates International, Inc. and Dun & Bradstreet Software remained outside the fold. The big guns, in turn, said they would be more likely to cast their lot with a mainstream effort rooted in, say, software industry association Adapso. Last week, skeptics and players alike saw their reservations addressed. Even as a planned merger of the fledgling SBPC into Adapso became a done deal, 17 new companies signed on — among them, D&B Software, CA, Andersen Consulting and Oracle Systems Corp.

CDC aims at open platforms

As further evidence that it is moving from proprietary solutions toward a systems integration approach, Control Data Corp.'s Computer Products Group last week announced a new version of EDL, its repository-based information management system. Version 5 of the product will run on Control Data's Cyber mainframes but will also support open platforms from Sun Microsystems, Inc., Hewlett-Packard Co., Digital Equipment Corp. and IBM. The software will have three modules, addressing users, managers and systems administrators. Control Data, which claims 450 EDL users worldwide, said the system will be available in May at a base price of \$3,000 per user.

Glitch found in HP minicomputers

A hardware problem that disables error detection circuitry after a power failure was discovered by HP in its HP 3000 Models 950 and higher in December. The difficulty with the memory controller was that it could pass errors through to a disk, according to a user. HP developed a software patch for the bug. The patch is available through HP's field offices.

Translator works on interfaces

Neuron Data Corp., an expert systems vendor in Palo Alto, Calif., said last week it has a product that can decipher the variations among the leading graphical user interfaces. Neuron claimed Open Interface can quickly map user applications to a variety of interfaces, including the Open Software Foundation's Motif, Microsoft Corp.'s Windows and Presentation Manager, Sun's Open Look and Apple Computer, Inc.'s Macintosh interface. Open Interface reportedly provides a screen layout editor and a set of C libraries for each environment.

Health board rebuts VDT miscarriage link

BY CAROL HILDEBRAND
CW STAFF

Pregnant women who spend a large portion of their time in front of VDTs do not run a higher risk of miscarriage, according to a report issued last week by the National Institute of Occupational Safety and Health (NIOSH). However, VDT health activists remained unconvinced, pointing out several issues they claimed the study did not properly address.

The NIOSH report compared the rate of miscarriage between two groups of telephone operators employed at two companies spread across eight Southwestern states. A total of 882 pregnancies were studied.

The first group used VDTs, and the control group used LED equipment. Both types of equipment produce extremely low-frequency electromagnetic field (EMF) emissions at 45 to 60 Hz and very low-frequency (VLF) EMFs at 15 KHz. The report found that the LED equipment did not emit VLF emissions above background levels. The

rate of miscarriage was 15% for VDT users vs. about 16% for non-VDT users.

"I think the study is very reassuring to women who use VDTs and are concerned about miscarriages," said Teresa M. Schnorr, principal author of the report for NIOSH, which is part of the U.S. Department of Health and Human Services.

However, Karen Nussbaum, director of 9 to 5, the National Association of Working Women in Cleveland, said the study is limited and that "it's a mistake to draw broad conclusions from it."

Louis Slesin, editor of the newsletter "VDT News," said he had problems with the measurements of the EMFs. "First, you can see that they did the measurements on EMFs two years after they had collected the pregnancy data, so it was an afterthought," he said.

Slesin also said using LED operators as a control population caused some problems because at times, their EMF emissions were equivalent to those of the VDTs. "They shouldn't have stretched to include EMFs as

part of their conclusions," he said. "If they had just said the use of VDTs, I would have a lot less problems with it."

The 9 to 5 group faulted the study's use of only two VDT models and the measurement of emissions from only 48 of them.

Both Slesin and Nussbaum also questioned the study's omission of questions about stress, which earlier studies have linked

I THINK THE STUDY is very reassuring to women who use VDTs and are concerned about miscarriages."

TERESA M. SCHNORR
NIOSH

to VDT health problems.

The third problem both groups found also involved the scope of the project. The report looked at miscarriages in recognized pregnancies but did not look at early fetal loss.

Schnorr acknowledged the lack of early fetal loss data, saying that techniques for detecting it have only recently been developed. She said that studies at Mt. Sinai Hospital are currently examining that issue.

Oracle

FROM PAGE 1

Manager, Oracle executives said. Several other companies are reportedly considering Oracle's offer to assist in "loosely coupling" their stand-alone hardware systems.

"The advantage of parallel systems is that one computer can stop while the others keep going," said Kenneth Jacobs, senior director of marketing at Oracle's RDBMS product division.

In a Vaxcluster, that means the number of deferred writes to a single, shared Oracle Version 6.2 database goes up, and there are fewer interruptions from the DEC Lock Manager required to keep VAX updates to the Oracle database "in sync," Jacobs said.

Industry analysts said the Oracle Version 6.2 news brings relief to hundreds of sites that run Oracle Version 5.0 or 6.0 on single VAX machines and are waiting to cluster them.

"In the short term, the only people to benefit from this Parallel Server option will be the Vaxcluster clients," said Donald Feinberg, program director for software management strategies at Gartner Group/Infocorp in Santa Clara, Calif. "Now, they'll be using Oracle 6.0 the way it's supposed to be used on a Vaxcluster."

DEC may enjoy its own windfall from the Oracle announce-

Ratings sheet

Codd and Date, Inc. verified these TPC Benchmark B results of Oracle's Version 6.2 running on Vaxclusters

Nodes	CPUs per node	Memory per node	Trans./sec.	Transaction cost/sec. (in thousands)
3	6	192M bytes	329.8	\$18.92
4	6	192M bytes	425.7	\$18.28

Tests were conducted on multiple VAX 6000 Model 560 systems using VMS Release V5.4-1

Source: Codd and Date, Inc.

CW Chart: Paul Mock

ment, which is expected to spark additional hardware sales to customers prevented from clustering their machines under Oracle Version 6.0. "We like to have good things keep happening to the Vaxcluster environment," said William LaVigne, Vaxcluster systems marketing manager at DEC.

Previously, VAX users had only two choices for running Oracle in a Vaxcluster: They could run Oracle Version 5.1 in a Vaxcluster mode with each machine updating a single copy of Oracle, or they could use SQL*Net to connect multiple VAXs, each running a separate copy of Oracle Version 6.0.

"We have been unable to move to Oracle 6.0 because of the amount of system overhead involved," noted James Rochford, manager of operations at a TRW, Inc. unit with three production Vaxclusters at Hanscom

Air Force Base in Bedford, Mass.

During the 18-month wait for Oracle to repair its Vaxcluster product, the base continued to run Oracle Version 5.1 on more than a dozen production VAXs that were "maxed out" by a user community of 3,000, Rochford said. "We have been loud and vocal in our requests to Oracle to provide us with a clusterable version of Oracle 6.0. The development of future Unix "distributed lock managers" still has the potential to extend existing Oracle databases in Unix sites, Feinberg said.

Pyramid is already working on a distributed lock manager to complement Oracle's Parallel Server, said Mark Bishop, Pyramid's database marketing manager. "There is a major effort under way that will enable multiple Pyramid systems to run against a single Oracle database," Bishop said.

Tandy CD-ROM set to shatter high-price barrier

Internal CD-ROM drive with \$399.95 retail price sacrifices a little bit of speed for affordability

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Tandy Corp. is set to break through the high price barrier restricting the mass marketing of compact disc/read-only memory (CD-ROM) technology by introducing an internal CD-ROM drive at a retail price of \$399.95.

The Tandy CDR-1000, which will be introduced at the Sixth Annual Multimedia CD-ROM Conference being held here this week, will be available immediately, according to the firm. Although its performance lags behind other CD-ROM drives on the market, with an access time

of about 900 msec, analysts concurred that users will probably be willing to sacrifice the slight delay in retrieval for a drive that is hundreds of dollars less expensive than its competitors.

"I definitely think that end users will give up performance for price," said analyst Bob Abraham, vice president of Freeman Associates, a market research firm in Santa Barbara, Calif. "This type of access time delay, which is in the hundreds of a second, is noticeable but forgivable by a user."

Although speed is an issue, "Tandy's CD-ROM drive price is

getting the product down to where it needs to be to reach the mass market," said Bob Gaskin, an analyst at Dataquest, Inc. in San Jose.

Other CD-ROM drives range from NEC Corp.'s \$599 portable version to Sony Corp.'s high-end internal drives that retail for about \$1,200.



Despite the slower speed, Tandy said it is able to offer the 150K byte/sec. data transfer rate established as part of a minimum standard for multimedia personal computer systems last year by a group of vendors.

Microsoft Corp. is also expected to demonstrate its own Windows-based multimedia authoring tool at the conference.

The product, code-named Windoc, is a software developer's tool that provides a direct link to a hypertext engine in Windows 3.0, providing a common interface retrieval structure under Windows for developers writing multimedia applications on CD-ROM discs, according to a Microsoft spokeswoman.

"This product is a tool for authoring certain kinds of applications. It is somewhat limited in that it is best-suited for text-intensive applications and can be used in conjunction with other

authoring programs," the Microsoft spokeswoman said.

There is some resistance in the CD-ROM industry to Microsoft's entry into this market. "It's one thing to evangelize a consistent interface and quite another to dictate the tools needed to make that interface," said Nick Arnett, chief analyst at Santa Clara, Calif.-based Multimedia Computing Corp.

However, a standardized search-and-retrieval system for CD-ROMs is necessary to help the CD-ROM market take off, according to Fred Meyer, president of Meridian Data Systems, a customized publishing systems house in Scotts Valley, Calif.

"We think Windoc under Windows 3.0 could provide a standard way of accessing information on a CD-ROM," Meyer said.

Microsoft

FROM PAGE 1

and OS/2. Last week, however, they were uniformly tight-lipped about the probe.

Gates "is flabbergasted" by the vitriolic comments directed at his company, said Vern Rayburn, chairman and chief executive officer of Slate Corp., who attributes a lot of the comments to sour grapes on the part of developers who put their eggs in the wrong basket.

Microsoft claims it is not a monopoly because it faces competition in every market it is in, added Bill Bluestein, an analyst at Forrester Research, Inc. Although it is the predominant supplier of PC operating systems, alternatives include versions of Unix, Apple Computer, Inc.'s Macintosh and Digital Research, Inc.'s DR DOS.

Analysts tended to dismiss charges that Microsoft purposefully deceives the industry. Developers are more apt to accuse Microsoft of heavy-handedness, if not unfair practices.

Microsoft has been "damn arrogant for a long time," said an attorney for a large developer, who said he believes the FTC investigation will become a "lightning rod" for complaints from all sides of the industry.

"The frustration in the industry over the OS/2 vs. Windows controversy is the primary insti-

gator," said Will Fastie, publisher of "The Fastie Report."

Microsoft is "acutely" aware of these sentiments, but Rayburn and Stewart Alsop, publisher of the "P.C. Letter," said company officials neither understand why nor know what to do about it.

"We know some people, like [Lotus Development Corp. President] Jim Manzi, think we faked

them into writing for OS/2, and that's not the fact," said William Neukom, vice president of law and corporate affairs at Microsoft. He said Microsoft has told developers to write to Windows for years, adding it placed its bets on Windows and OS/2.

If the FTC decides Microsoft is acting in an anticompetitive manner, it can order remedies ranging from a cease-and-desist

order to restitution. It could even order the breakup of Microsoft. The U.S. Department of Justice only steps in when criminal actions, such as conspiracy or restraint of trade, are involved, an FTC spokesman said. Much depends on whether the FTC is focusing on the 1989 announcement as an artificial restraint on Windows or views it as a move to deceive competitors into writing for OS/2. Microsoft has since declared that its own short-term focus is squarely on Windows development.

"It appears the FTC is a little out of date. Microsoft is clearly not trying to restrain Windows," Alsop quipped.

Fastie said the real issue is whether Microsoft's applications group unfairly benefits from Microsoft's dominance in

desktop operating systems and environments. None of the developers contacted believes Microsoft maintains a "Chinese wall" between the two groups, although opinion is split on whether that creates a problem.

Fastie, Rayburn and many analysts view Microsoft as a formidable competitor that, while not particularly innovative, keeps its ears open and acts quickly, often to the chagrin of outfoxed competitors. "It doesn't mean they are doing anything illegal; they just are scrappy," Fastie said.

Microsoft is not expected to change its aggressive approach unless it is forced to. Still, some angry developers hold out a glimmer of hope that Microsoft might take the hint and voluntarily take a lighter approach to handling its affairs.

Is it vapor or wares?

"When Microsoft enters the room and flips its hat, dozens scramble to catch it," Philippe Kahn, chairman of Borland International, Inc., said in a recent interview.

Microsoft's competitiveness has spurred charges that it announces nonexistent products with features that match or beat the competition. When it released OS/2, Microsoft said MS-DOS 4.0 would be the last formal release of DOS. When Digital Research, Inc., which produces an alternative DOS product called DR DOS, subsequently introduced DR DOS Version 5.0 last April, Microsoft immediately announced it would have its own Version 5.0, which is not yet available.

A similar situation occurred in January after Go Corp. announced a press conference to demonstrate its newly created pen-based operating system. A week before the Go conference, Microsoft officials hastily arranged a breakneck tour to demonstrate a prototype of their Pen Windows handwriting recognition technology — a product without final delivery date, price or feature set.

A perceived about-face on OS/2 enraged many software developers. Lotus Development Corp., for example, has invested upward of \$50 million in OS/2, a source said. These developers are now struggling to catch up with Microsoft, which has had a head start in releasing Windows applications.

JAMES DALY

Ultrix comes to VAX 9000 with DEC's Version 4.2

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. brings its own flavor of Unix to the mainframe VAX 9000 this week with the announcement of Ultrix 4.2 and a companion version with special graphics enhancements for workstations and servers.

The next significant change in Ultrix comes later this year, company officials said, when the operating system switches its kernel to the Open Software Foundation's OSF/1 kernel and complies with AT&T's Unix System V Release 4.

Along with new support for the mainframe platform, DEC will be bundling an enhanced version of Ultrix SQL into Ultrix 4.2 in much the same way it included the runtime version of its RDB relational database manager in the VAX/VMS operating

system. Also new in Ultrix 4.2 is support for Fiber Distributed Data Interface on the Decstation 5000 and support for the TA 91 high-end tape drive.

The new version of Ultrix SQL 2.0, based entirely on Ingres Corp. technology, now supports on-line backup of the database without bringing the machine down. DEC also improved the integrity of database transactions and doubled the support of large table definitions.

The companion version of Ultrix 4.2 is Ultrix Worksystem Software 4.2, which includes additional features designed for workstations and servers such as multiscreen support, allowing users to display up to three screens at once on the Decstation 5000.

It also offers support for X Window System 11 Release 4, the latest version of X Window shipping from MIT.

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TRENDS

DEC
VAX 6000 and 8000
series

Current fair market values

Discounts on used VAX 6000s have caused prices on used 8000s to drop. Today, a used VAX 8700 sells for about half of last year's price

VAX 6000 series; fair market value as of February 1991

VAX model*	First available	List price	Used market value (in dollars)	Used market value (as a percent of original list price)
6000-210	April '88	\$175,300	\$66,000	38%
6000-310	Jan. '89	\$193,305	\$87,000	45%
6000-420	July '89	\$419,000	\$230,000	55%

VAX 8000 series; fair market value as of February 1991

VAX model	First available	List price	Used market value (in dollars)	Used market value (as a percent of original list price)
8200	Jan. '86	\$98,000	\$6,000	6%
8300	Jan. '86	\$133,000	\$8,400	6%
8530	March '87	\$364,455	\$36,000	10%
8550	Aug. '86	\$427,560	\$52,000	12%
8600	Oct. '84	\$470,475	\$19,000	4%
8650	Dec. '85	\$524,775	\$46,000	9%
8700	Aug. '86	\$629,370	\$48,000	8%

*Not enough information on the VAX 6000-220, 6000-320 or the 6000-410 to establish a current fair market value

Source: Technology Investment Strategies Corp., Framingham, Mass.

CW Chart: Tom Monahan

N E X T W E E K

Mackey J. McDonald, chief executive officer at Wrangler, has seen the blue jeans business change dramatically in a short span of five years. He says he devoutly believes that timely information is the key to conquering the new competitive forces. McDonald shares his thoughts on IS in *The CEO View*, a monthly series in *Manager's Journal*.



Chip Henderson

Desktop personal computers based on the Intel 80386SX chip have been hot sellers of late; they are regarded in some quarters as the new minimum corporate computing platform. Technology Analysis continues its coverage of these systems with a look at 20-MHz machines from both Dell Computer and Advanced Logic Research.

INSIDE LINES

Loose lips sink ships

In late January, when Microsoft revealed it was taking the shackles off Windows development, it was tough to sort through angry comments from software developers who felt they had been duped into developing for OS/2. Last week, in the wake of a disclosure that Microsoft is being probed by the feds, it was tough to get any industry exec to comment — at least on the record. Rather than bury all the juicy stuff, we've decided to print some comments here that we can't attribute, along with some wry observations about the supposed "Chinese wall" the company claims stands between its applications and systems software divisions:

• A developer close to Microsoft says the object linking and embedding scheme Microsoft is pushing for Windows applications was actually developed on the applications side. It was first homegrown for Powerpoint and further refined in Excel 3.0, which was released in May 1990. "Yet the libraries still have not been released [to developers] in any stable form," the developer says. "There's enough stuff there so that it smells funny. It could be like the Keating Five in that there is a perception of impropriety."

• "There is no separation of church and state. Gates is the king and the pope. He's like a bumblebee cross-pollinating different flowers at Microsoft. He personally does code reviews on system software and applications software." — *Anonymous*

• "It seems Microsoft has a win/lose attitude. They are determined to win at your expense. They want to win and make sure that you lost and then rub your face in it. Their attitude is: 'If we humiliate you in the process, then maybe you'll go away and not come back again.'" — A developer who has negotiated with Microsoft

• "The only thing more dangerous than betting against Microsoft is to bet *with* them." — *Anonymous*

• "Bill Gates didn't set out to be liked." — Stewart Alsop, industry analyst and publisher of "PC Letter"

He should know, right?

Some would argue that Microsoft should spin out its applications software sector into a separate business unit, thus defusing suspicions that the tight link between operating systems and applications divisions constitutes improper business practices. Not likely, Microsoft officials said. "We don't think it's required. We're running it legally and fairly and in good faith," said William Neukom, vice president of law and corporate affairs. "There would be nothing in it for us."

As The Mail-Order World Turns

Northgate Computer Systems rebutted last week's item here about funding problems. Gary Held, president of the mail-order PC firm, indicated he is fed up with bankruptcy rumors spread by competitors and said that Northgate not only has plenty of room left on its line of credit, but it also reduced bank debt "substantially" last year. Held said the company's earnings report, expected to be released in two weeks, will show that it returned to profitability in the first two months of this year. He also confirmed Northgate lost money in 1990.

Now hear this! Now hear this!

This promises to be a busy week for fault-tolerant computing, with announcements scheduled from both DEC and Stratus Computer. Industry sources say Stratus will introduce an eight-way processor to succeed its six-way system, plus a uni-processor based on Intel's N10 RISC chip. DEC is expected to deliver on earlier promises to extend crash-proof computing more broadly across the VAX line, with the unveiling of two or three new VAX FT3000 models.

A final word on Microsoft: The company's defenders rebut any antitrust tendencies by pointing out that computer users are free to select from alternatives such as Unix or the Macintosh and its operating system. Well, sources briefed by Microsoft on the so-called Portable OS/2, otherwise known as Version 3 or more cynically referred to as OS/3, said future versions will work not only with RISC-based Unix workstations but also with the Macintosh. Is there such a thing as too much success? But hey, enough bickering. If you've got real news, get in touch with News Editor Pete Bartolik at (800) 343-6474.

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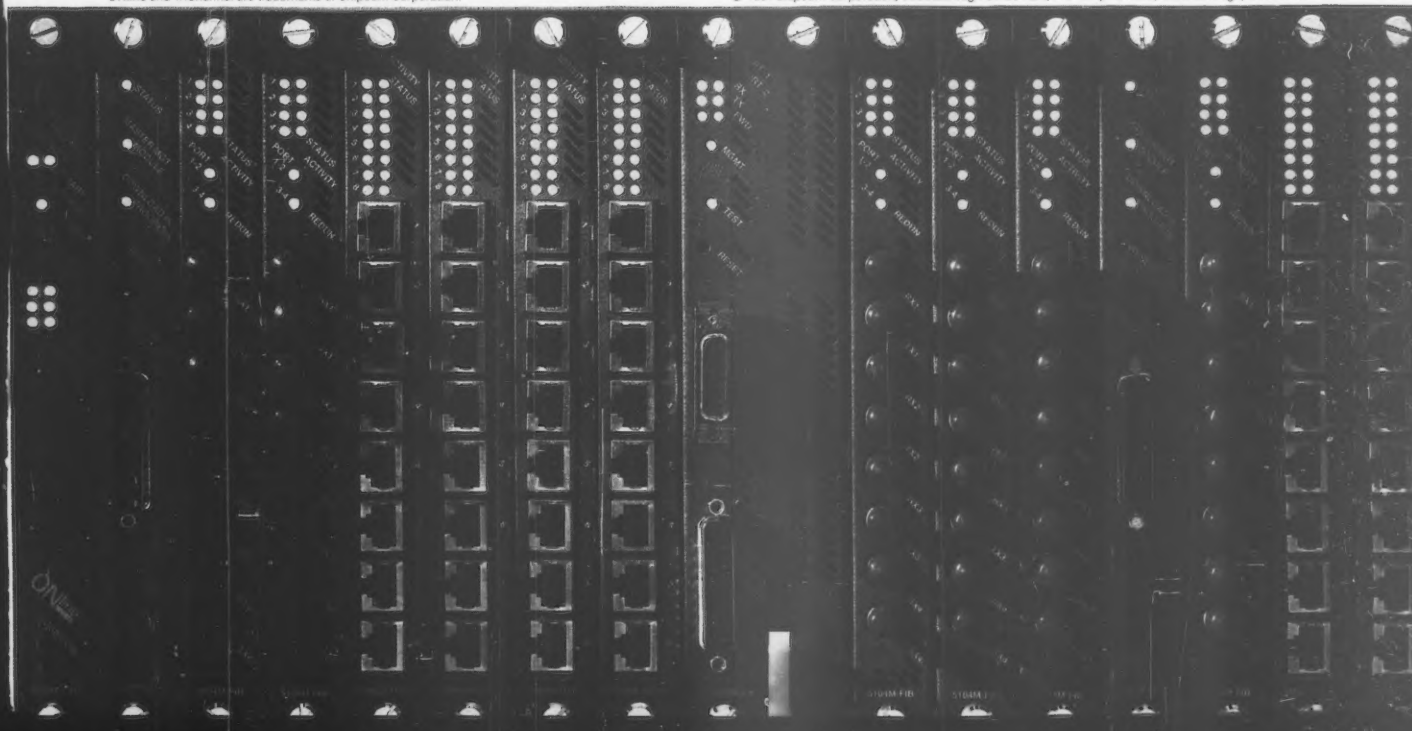


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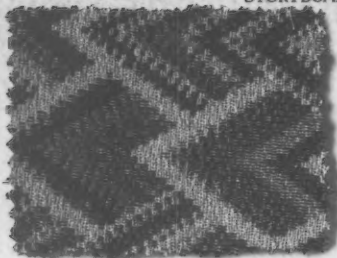
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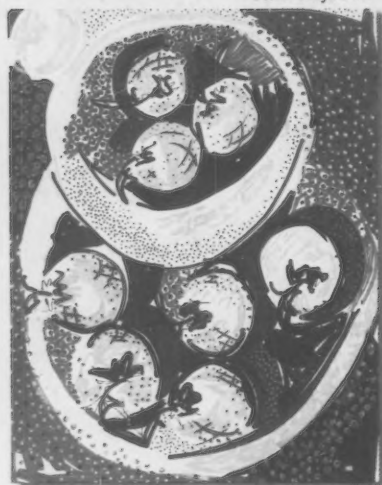




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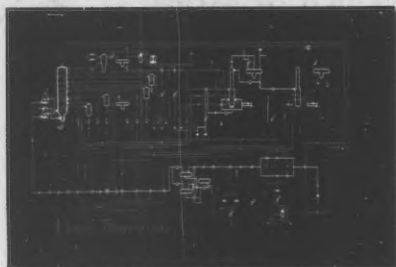
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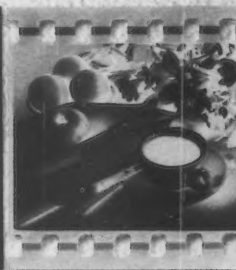
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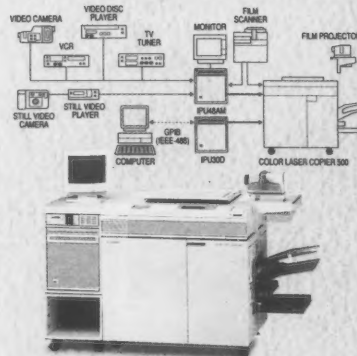


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